NORGES HANDELSHØYSKOLE

Bergen, June 2012

From the Board Room to the Top

Christine Danielsen

Camilla Hagerup Hovden

Master Thesis within the main profile of Strategy and Management

Spring 2012

Thesis Advisor: Astrid Kunze

NORWEGIAN SCHOOL OF ECONOMICS

Abstract

The purpose of this thesis is to test whether there is a positive relationship between the share of female board directors and the share of women in the top executive management group within the same companies.

In 2006, the Norwegian government passed a law that required all Public Limited Companies to have at least 40 percent women present on their boards. The companies were given a transitional period of a couple of years to conform, but by 2008 all the firms had to fulfill the requirements of the law.

Our hypothesis is that the law could create spillover effects to the top executive management group of firms by making women in positions of power more visible, and in turn, desirable. Our results show that there is a positive relationship between our variables. It is evident that the firms with a high percentage of female board directors in 2004 have a significantly higher proportion of female top executive managers in 2010, compared to those firms with few female board directors in 2004.

Foreword

This thesis is written as the final piece of work concluding a masters degree in Strategy and Management at The Norwegian School of Economics. It is written with the purpose of analyzing the possible connection between the gender quota reform requiring 40 percent female representation on the boards of all Norwegian Public Limited Companies, and female representation in the top executive management of the same companies.

The idea for the thesis appeared during the course *STR445: The composition of the workforce: women, men and work*. The curriculum in this course introduced several of the issues we address in this thesis, such as the glass ceiling, vertical and firm segregation, as well as discrimination and the gender wage gap.

A substantial part of the work has been put into collecting and analyzing our data. This proved both challenging and, in some cases, impossible. To make our final data set as complete as possible, we had to replace our original data set several times.

Regarding the collection of data, we would like to thank Aksel Mjøs for access to the SNF database, making it possible for us to draw a suitable sample.

We would also like to thank our supervisor, Astrid Kunze from the Department of Economics, for guidance, feedback and support throughout the whole project.

Finally, we would like to thank each other for the cooperation on this thesis.

Bergen, June 2012

Christine Danielsen Camilla Hagerup Hovden

Table of Contents

Abstract……II

Foreword……..III

List of Figures and Tables……... VI

1. Introduction……..1

1.1 Historical Background……. 2

1.2 The Norwegian Example……. 2

1.3 Research Question……..... 5

1.4 Structure of the Thesis……. 6

2. Institutional Background……. 6

2.1 Gender Equality in Norway……..... 6

2.2 Public Limited Companies (ASA)……... 7

2.2.1 The Board of Directors……..... 8

2.2.2 The Public Limited Liability Companies Act……..8

2.2.2.1 Modification of 40 Percent Rule……..9

2.3 The Number of ASA's Over Time…….. 11

3. Economic Mechanisms……12

3.1 Supply Side versus Demand Side Explanations…….. 13

3.2 The Double Bind – Stereotypes and Cultural Expectations…….14

3.3 Female Role Models…… 16

3.4 Mentoring; Important for Men, Essential for Women……16

3.5 Socialization and Networks……. 19

3.6 Cross-sex Bias……..19

4. Methodology……21

4.1 Research Design…….. 21

4.2 Data Collection……..... 22

4.3 Data Description…….. 24

4.3.1 Definition of the Top Executive Management Group…… 24
4.3.2 Description of Main Variables……25
4.3.3 Categories Based on the Gender Quota Reform…….. 26
4.3.4 "Low" and "High" Group of the Final Sample……26
5. Empirical Analysis……...27
5.1 Descriptive Statistics……27
5.2 Main Empirical Results……32
5.2.1 The Estimation Approach…… 32
5.2.2 Empirical Results……37
5.2.3 Discussion of the Results……45
5.2.3.1 Validity……45
5.3 Further Findings…….. 46
5.3.1 Firms' Adjustment of Fraction of Women to the Quota……..46
5.3.2 Firms That Had Not Fulfilled the Quota by the End of 2008…….. 49
6. Discussion……49
6.1 Suggestions for Further Research……56
7. Conclusion……...57
8. Attachments……58
8.1 List of Companies in the Analysis……...58
9. References……59
9.1 Articles, Books, and Reports……... 59
9.2 Lecture Notes……...61
9.3 Master Theses…….. 61
9.4 Websites……...61
9.5 Annual Reports…… 63
APPENDIX…… 70

List of Figures and Tables

Figure #	Name of figure	Page
1	Percentage of women in higher education, depending on field of study (1980 and 2006)	3
2	Number of female and male students in Norway, 1980-2007	3
3	Percentage of female leaders at different levels of the organization, in Norway, 2006	4
4	Percentage of employees in managerial posts in different OECD-countries, 2004	4
5	Distribution of board directors in ASA's by gender, 2004	5
6	Distribution of board chairmen in ASA's by gender, 2004	5
7	Percentage of female board directors in AS and ASA, 2004-2011	10
8	Number of ASA's overall, and those who fulfill the quota, yearly	11
9	The most important dates in the development of the gender quota reform	21
10	Mean female percentage, final sample of 88 firms	28
11	Comparison of mean percentage of women on the board	29
12	Comparison of the mean standard deviation of the two groups	29
13	Comparison of mean female board representation, including graph from Statistics Norway	30
14	Mean percentage of female board directors for "low" and "high" group	33
15	Female board (2004) and top management (2010) representation for each firm in the "low" group.	34
16	Female board (2004) and top management (2010) representation for each firm in the "high" group.	36
17	"Low" group versus "high" group, percentage of female Board Directors in 2004 and Top Management Executives in 2010	37
18	Employed in the different sectors; in Norway, by gender	43
19	Female percentage of board directors in 2004 and female percentage of top executive managers in 2010, by sector	44

Table #	Name of table	Page
1	Minimum requirements to fulfill the gender quota reform, by board size	10
2	Description of main variables included from the SNF data base	25
3	Summary statistics, "boardsize"	26
4	Summary statistics, "nrofemployees"	26
5	Number of firms in "low" and "high" group	27
6	Summary statistics,female board directors 2004-2009	28
7	Board size: mean, standard deviation, and confidence intervals, yearly	29
8	Main result 1; regression of total sample of 88 firms, top2010 board2004	32
9	Mean female percentage of Board Directors in 2004 and Top Management Executives in 2010, for "low" and "high" group.	37
10	Main results 2: top2010 group_low2004	39
11	Main results 3: Comparison of the regressions (1), (2), and (3)	41-42
12	In what way have the affected firms met the requirements of the gender quota reform?	47
13	In what way have the affected firms met the requirements of the gender quota reform? Displayed by "low" and "high" group	48
14	List of firms that had not fulfilled the quota by the end of 2008 and 2009	49

1. Introduction

Women's representation in the work force is a controversial and current issue that one can find being debated in the media on a daily basis. A quick search on Google for "women in the workforce" results in almost 10, 000 articles published within a week alone. Where one previously would debate whether or not women should work at all, society's view of equal opportunities regardless of gender has evolved to the point where one now questions the fact that women are underrepresented in the top executive management groups of firms.

For companies to overcome the increasingly difficult and multifaceted challenges they are faced with in the business world today, it is generally agreed upon that it is crucial to have access to the largest possible talent pool. Women graduate with higher degrees and greater ambitions than ever before, and the business world is starting to realize that it would be unwise to exclude these women when considering new candidates for their firm.

Most of the recent research that has been done regarding the representation of women in the business world has been centered around the corporate board room, and not on the top executive management group. Little research has been done on the possible spillover effects between women in the boardroom and women in top executive positions. We think this is a highly relevant issue considering the large focus on gender differences in the business world today. Some organizations have made female leaders their focus of attention. The Confederation of Norwegian Enterprise (NHO) has created a program called "Female Future" with the sole intention of educating women in order for them to reach the next level in their management career. Within the last nine years they have helped 1300 women become more aware of their leadership potential. Furthermore, McKinsey & Company have, since 2007, published an annual report called "Women Matter". This report focuses on several aspects regarding the value of gender diversity in organizations. These initiatives show that there is a growing interest in this topic and that organizations are making it a priority to highlight the issue.

On the other hand, the discussions concerning female representation do not only appertain to the business world. There are constant examples of this topic in the media. None of the 22 movies that were nominated at the 2012 Cannes Film Festival are directed by women. This has made some of the jurors raise their eyebrows at the lack of female film directors. In addition, a debate recently erupted when a sports-spokesperson from a Norwegian political

party posted a negatively charged comment about women's soccer. These examples illustrate that it is important to keep addressing gender issues in order to erase the archaic attitudes that still can be seen in the society today.

1.1 Historical Background

"Behind every successful woman there is a surprised man"

(Unknown)

In the US, women's increasing involvement in the workforce was the most significant change in the labor market during the past century. Goldin (2006) refers to this change as the three evolutionary phases, resulting in a "quiet revolution". The distinction between evolution and revolution reflects three specific aspects of women's preferences, choices, and decisions. The first aspect is "horizon", concerning the form and duration of a woman's lifetime in the labor force. The second aspect is "identity", concerning individuality in the job, while the third aspect is "decision making", concerning whether the woman's labor force decision is made jointly within the family or not. The transition was a change from static to dynamic decision-making, moving from limited to long-term horizons. Women went from working for money – in their jobs, to finding an identity and societal worth – in their careers (Goldin, 2006).

The first evolutionary phase lasted from the late nineteenth century to the 1920s, and saw the birth of an "independent female worker". In phase two, from the 1930s to 1950, the labor force participation rate for married women increased from 10 to 25 percent. This leap was mostly due to the increased demand for office and clerical work with the arrival of new types of information technologies. As the demand for female workers increased, work for women also became more accepted, particularly by these women's husbands. The third phase occurred between the 1950s and the 1970s. For married women between 35 and 44 years of age, the labor force participation rate increased from 25 to 46 percent (Goldin, 2006). Although this evidence is for the US, one can expect that a delayed, but somewhat similar development has occurred in Europe.

1.2 The Norwegian Example

In Norway, the trend for women entering the work force has been very similar to the situation in the US. After World War II, and through to the middle of the 1970s, Norway was one of the countries in Europe with the lowest female participation rate in the work force (Røys, 2006). From the middle of the 1970s throughout the 1980s there was a development that

changed our society; married women entered the work force. Between 1974 and 1988, almost 360 000 women entered the work force (Røys, 2006).

Today, Norway is one of the countries with the highest rates of women both in the labor force, and in higher education (Storvik, 2011). As one can see in Figure 1, 60.2 percent of the people who pursued higher education in Norway in 2006 were women.

Tabell 3.1 Kvinneandel i høyere utdanning, etter fagfelt. 1980 og 2006. Prosent

	1980	2006
Høyere utdanning i alt	48,1	60,2
Humanistiske og estetiske fag	59,2	63,5
Lærerutdanninger og pedagogikk	69,2	74
Samfunnsfag og juss	41,9	60,8
Økonomisk-administrative fag	24,9	53,9
Naturvitenskapelige fag, håndverksfag og tekniske fag	16,8	32,1
Helse-, sosial- og idrettsfag	70,3	77,2
Primærnæringsfag	22,6	51,2
Samferdsel, sikkerhet og andre servicefag	2,5	27
Uoppgitt	52,1	62,8

I tallene fra 2006 er norske studenter i utlandet med i statistikken, men de er ikke med i 1980.
Kilde: Teigen (2006:19) og SSB (2007)

Figure 1: Percentage of women in higher education, depending on field of study (1980 and 2006).

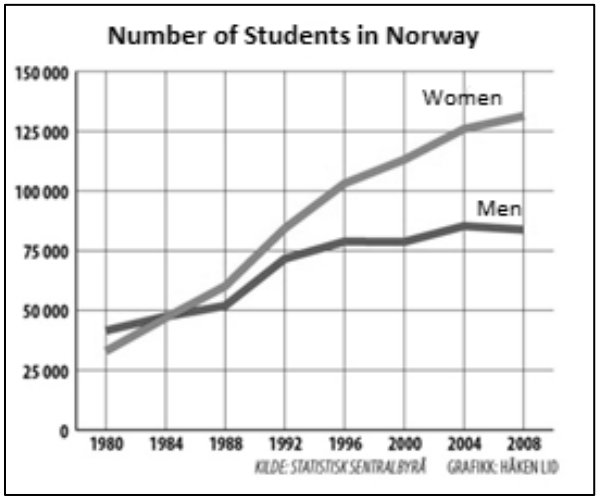

Figure 2: Number of female and male students in Norway, 1980-2007 *(ssb.no, 2007)*

However, Norway now faces a situation defined as the Norwegian paradox (Storvik, 2011). Even though the majority of the highly educated population consists of women, and there has been a lot of focus on equal rights, Norway still has one of the lowest rates when it comes to women in positions of power (Storvik, 2011). In Figure 3 one can see that in Norwegian organizations, there are less than 20 percent female top executives. The corresponding number for middle management is almost double, yet still below 40 percent. The majority of the female leaders are working in the public sector. If we compare with other OECD-

countries, one can see from Figure 4 that the Norwegian fraction of female leaders is slightly above the OECD-average, but below countries such as the United Kingdom and the US.

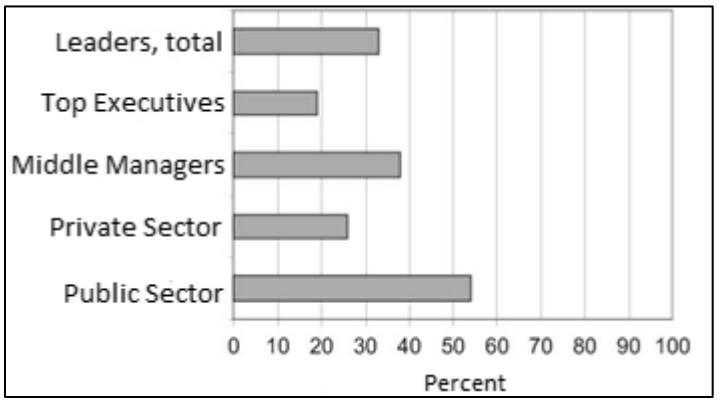

Figure 3: Percentage of female leaders at different levels of the organization, in Norway, 2006.

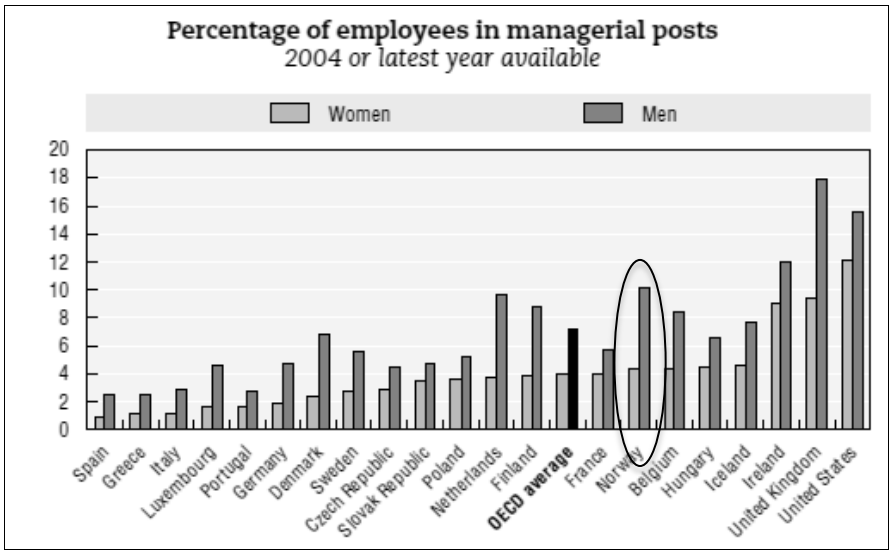

Figure 4: Percentage of employees in managerial posts in different OECD-countries, 2004. *(oecd.org, 2011)*

Before 2002, the number of female board members in Norwegian Public Limited Companies (ASA) had laid steadily at approximately 6 percent (Jørgensen, 2010). In February 2002, the minister of trade and industry, Ansgar Gabrielsen, introduced a proposal to require all Public Limited Companies to have at least 40 percent women on their board of directors. The purpose of the law was first and foremost to create more gender equality (Storvik, 2011). At the start of 2004, only 2.6 percent (14/546) of board leaders, and only 9.0 percent (254/2800) of board members, were women (Figure 5). The proposal was met with both skepticism and criticism, but on December 19, 2003 the law was signed. Worldwide, this law was the first of its kind. Today, several other countries, such as Spain and Holland, have followed the Norwegian example.

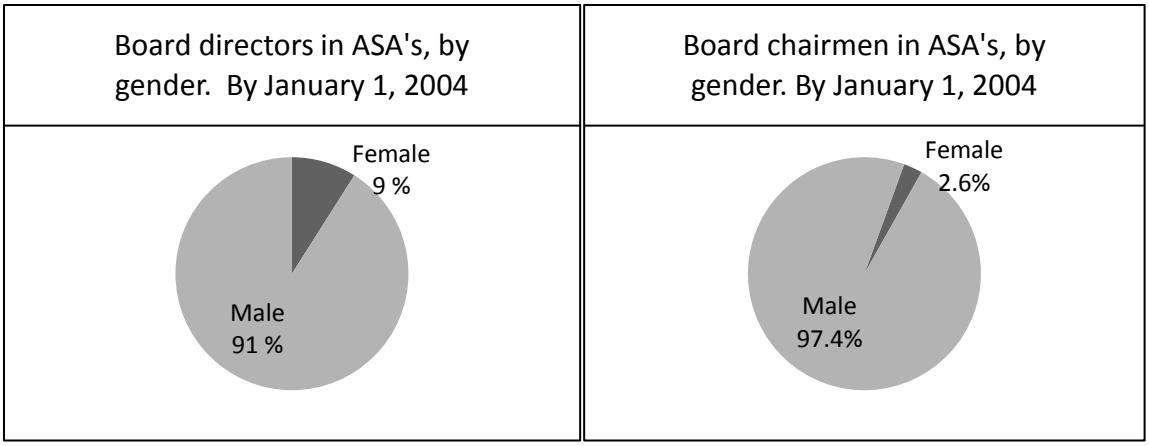

Figure 5 (left): Distribution of board directors in ASA's by gender, 2004
Figure 6 (right): Distribution of board chairmen in ASA's by gender, 2004 *(ssb.no, 2011)*

Right after the introduction of the law, there were no noteworthy changes in the composition of the boards. The government then decided to impose sanctions on the companies if they did not react. By the final deadline of January 1, 2008, all the companies had fulfilled the requirements of the law (Jørgensen, 2010). We will elaborate on details concerning the law in chapter 2.2.2.

Today, Norway has reached the goal of 40 percent female representation on the boards of Public Limited Companies. However, there are still very few women in top executive management.

1.3 Research Question

Our research question is to test whether there is a significant spillover effect between female board representation right after the gender quota reform was introduced, and female top executive representation in the same firms, three years after all the affected firms fulfilled the requirements of the law. If there is in fact a positive spillover effect, one could argue that interventions like the one the Norwegian government took, are effective. The direct effect of the reform is that the firms fulfilled the requirements of the law, but the possible indirect effects might be even more interesting. One might hope that the reform could lead to changes in beliefs and attitudes among those who feel that men are still better suited in positions of power compared to women. Introducing women to the boards might lead to breaking down some stereotypes and cause a breach in the traditional male hierarchies. This in turn could propagate to other parts of the organization, creating more diversity and gender equality in all parts of the business world.

We analyze the effects of the gender quota reform that applies to Norwegian Public Limited Companies. To conduct this empirical analysis we used data from "Brønnøysundregisteret[1]", supplied with hand collected information. Public Limited Companies are the only firms that are obliged to have information such as their annual reports available for the public. This aids us in retrieving the information we need for our research.

Even though other countries have started to follow in Norway's footsteps and have created similar reforms, we have decided to focus only on Norway. We are not sure if it is too early to see any spillover effects from the reform in Norway, and thus we believe it will be less likely that the effect is observable in other countries where the reform is more recent. Our limitations are also based on restrictions regarding time and the scope of the thesis.

1.4 Structure of the Thesis

The rest of the thesis is structured as follows: Chapter 2 presents the institutional background, including an introduction of the gender quota reform, some legal terms regarding a Public Limited Company and information on how the board of directors functions. Chapter 3 presents economic mechanisms and our main hypotheses as to why more women on the board of directors should lead to more women in top executive positions. In chapter 4, the methodology chapter, we will explain our methodological approach, including our research design, data collection, sample etc. Chapter 5 presents an analysis and discussion of our results, as well as some further findings. In chapter 6 we will present a discussion of our topic, in addition to some suggestions for further research. In chapter 7 we will present our conclusion.

2. Institutional Background

2.1 Gender Equality in Norway

Norway has always been one of the leading countries when it comes to equal rights. In 1913, Norwegian women were given the general right to vote, as one of the first countries in the world. This is especially relevant comparing to other developed European countries such as Switzerland and Portugal, who passed the same right in 1971 and 1976, respectively. As early as in 1981, Gro Harlem Brundtland became the first Norwegian female Prime Minister, and in

[1] *The Brønnøusund Register Centre is a government body under the Norwegian Ministry of Trade and Industry, and consists of several different national computerized registers (brreg.no, 2012).*

1993, Kirsti Kolle Grøndahl followed as the first Norwegian female Member of Parliament. In 2010, the percentage of women in the Norwegian Parliament was 39.6 (stortinget.no, 2010).

In 1978, the Norwegian government passed the Law of Equal Rights. The purpose of the law was to create equality between the two sexes regarding opportunities in society, household and work, and specifically to improve the position of women. The law states that the employer shall work actively and organized within their scope of action to create equality between the sexes. Other central aspects of the law include that men and women shall have the same opportunities to education, and that they shall receive the same payment for work of equal value (lovdata.no, 2012).

In 2006, more than 60 percent of the people in higher education were women (ssb.no, 2007). Even though women are entering the work force in increasing numbers all over the world, Norway has been a leading country in facilitating this movement. One example of this is the parental leave policy in Norway. Today, the system gives the parents of newborn children the right to leave work for a combined period of 12 months with full payment and security to return to the same position they had before the leave (regjeringen.no, 2011).

According to numbers from Statistics Norway, Norwegian women earn on average NOK 85 for each NOK 100 that men earn. The differences are largest in the private sector and among those with the highest level of education, and this gap has remained stable during the last decade (Karkov, 2011). Comparing to the rest of Europe, the Norwegian gap is slightly smaller than the EU average of 83/100. (Mellemstrand, 2009). Norway is also one of the most vertically segregated economies in the world. For example, men comprise 70 percent of the employees in the private sector (Kunze, 2011). If men and women continuously seek different occupations and women go into relatively low paid occupation groups, this might cause the gender wage gap to persist. As a consequence, women might not seek to reach the highest executive positions, knowing that the hard work required for these positions, will not pay off as well as for their male counterparts.

2.2 Public Limited Companies (ASA)

A Public Limited Company is defined as a company registered under the Norwegian Public Limited Liability Companies Act of 1999 (asal), with statutory minimum capital requirements and shares offered to the public, subject to conditions of limited liability (ordnett.no, 2012). The company is required to have a share capital of at least NOK 1 million, cf. asal. § 3-1(1), a

board of directors consisting of at least three members cf. asal. § 6-1(1), and a general manager cf. asal. § 6-2 (Aavatsmark & Rønningen, 2011).

2.2.1 The Board of Directors

According to the Norwegian Public Limited Companies Act, each company shall have a board of directors comprising at least three members. The board is responsible for the general management of the company. In brief, this entails responsibility for most of the central business related decisions. Some examples include evaluating the attractiveness of dividends, approving the company's financial statements, and advising in merger and acquisitions cases (Kennon, 2012). The Act also states that the board of directors is responsible for being the public face of the company on behalf of the shareholders.

The board recruitment process is divided into several phases. The need for a new board member has to be recognized, followed by a search and selection process, either by the general committee, or the employees. Traditionally, the recruitment of board directors has occurred through professional, social networks. However, new and enjoined rules such as the Limited Liability Companies Act of 1999, the Public Limited Liability Companies Act of 2003, as well as the Accounting Act, and the Securities Trading Act, give clear restrictions as to the structure of the board. Rules for risk management and control have created awareness on the choice of board directors, which in turn has led to a professionalization of the selection process. This often includes the use of election committees designated by the general committee. The work of the election committee secures that the recruitment process will be more systematic, and less affected by coincidence and individual desires (Heidenreich, 2010).

2.2.2 The Public Limited Liability Companies Act

In December 2003, the Norwegian Parliament signed an amendment to the Public Limited Liability Companies Act demanding gender balance on the boards of Public Limited Companies. As the companies did not conform to the requirements of the law voluntarily, the law came into force for Public Limited Companies on January 1, 2006. Companies registered before this date had a transitional period of two years to comply with the law, while companies registered after this time had to fulfill the demands in order to be registered as a Public Limited Company. If a company did not fulfill the requirements by the end of 2008, the government would impose sanctions on the company – and worst case scenario demand that the company is dissolved. The law contains two parts. The first part concerns the part of the board that is elected by the shareholders. The second part of the law deals with the rules

concerning worker representatives. This is not outlined further as we focus on the first part of the reform.

The law requires that on boards where the members are elected by the shareholders, each gender has to be represented by 40 percent. This is not an absolute demand, as it will be highly difficult for boards with very few members to stay within the boundaries of 40 percent representation of each gender. For instance, in a board with three members, where two are male and one female, the female share is 33 percent. If you replace one of the male members with a female, the male share would be 33 percent. This is not compatible with the notion of a law that is gender neutral. The Public Limited Liability Companies Act §6-11a (1-4) therefore specifies that both genders should be represented on the board according to the following:

1. *If the board has two or three members, both genders must to be represented*
2. *If the board has four or five members, each gender shall be represented by at least two members*
3. *If the board has six to eight members, each gender shall be represented by at least three members*
4. *If the board has nine members, each gender shall be represented by at least four members, and if the board has more members, each gender must be represented by at least 40 percent of the members*

(lovdata.no, 2012)

2.2.2.1 Modification of 40 Percent Rule

The gender quota reform is usually referred to as the 40 percent rule, but this is only a partial truth. It is important to remember that this percentage is not an absolute demand, and that the law has different requirements depending on the number of members present on the board.

If a board has two or three members, the firm is required to have both genders represented. In this case the minimum percentage needed to fulfill the gender quota reform is 33.33 percent. When a board consists of four or five members, each gender has to be represented by at least two members. Here, the minimum requirement is 40 percent. If a board has six to eight members, the firm is required to have at least three members of each gender. The minimum percentage in this case is 37.5 percent. When the board consists of nine members, each gender shall be represented by at least four members – leaving us with a minimum percentage of 44.44 percent. Finally, the minimum requirement is 40 percent representation of each gender when the board consists of ten members or more.

Board size	Minimum requirement of female representation
2, 3	33.33%
4, 5	40%
6, 7, 8	37.50%
9	44.44%
> 9	40%
Minimum average:	**39.05%**

Table 1: Minimum requirements to fulfill the gender quota reform, by board size

In Table 1 we combine these minimum requirements and it leaves us with an un-weighted average percentage of 39.05; in other words, slightly below the official demand of 40 percent.

Figure 7 shows the development of the percentage of female board members in Norwegian Public Limited Companies from 2004 to 2011. As we can clearly see, the law has been effective. From 2009, the number of female board directors has laid steadily at 40 percent. We see that the growth of female board members in Limited Companies[2], where there is no requirement for a certain share of female representation, has been virtually nonexistent. One could therefore ask if the law has successfully changed the actual numbers, but not yet touched the underlying attitudes.

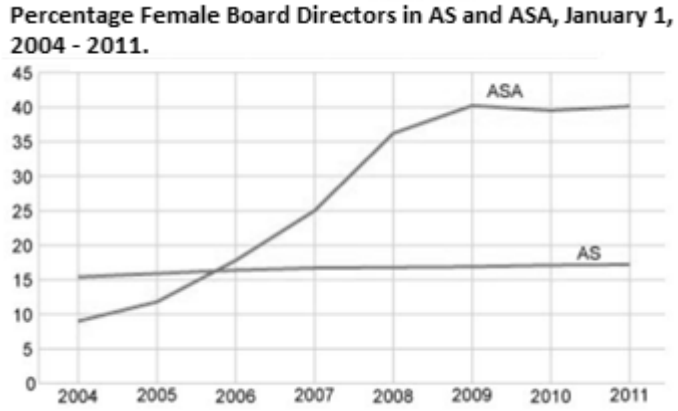

Figure 7: Percentage of female board directors in AS and ASA, 2004-2011.
(ssb.no, 2011)

The Secretary of State in the Norwegian Ministry of Trade and Industry, Rikke Lund, suggested in 2011 that there should be requirements regarding the gender composition of the board in all firms, not only Public Limited Companies. According to numbers from Statistics Norway, women occupy only 17 percent of board chairs in private companies, and as many as seven out of ten private companies have boards without any women present at all (ssb.no,

[2] Limited Company (Norwegian: AS); a company with fixed capital divided on one or more shares, where the shareholders have no personal responsibility for the company's obligations (snl.no/aksjeselskap)

2010). This proposition was thought to be highly controversial, but it shows that the business world is continuously aware of the gender gaps.

2.3 The Number of ASA's Over Time

The number of Norwegian ASA's has decreased significantly since the introduction of the reform. Even though there may be several reasons for this decrease in ASA's, such as the financial crisis, one can easily wonder whether the gender quota reform was an influential factor.

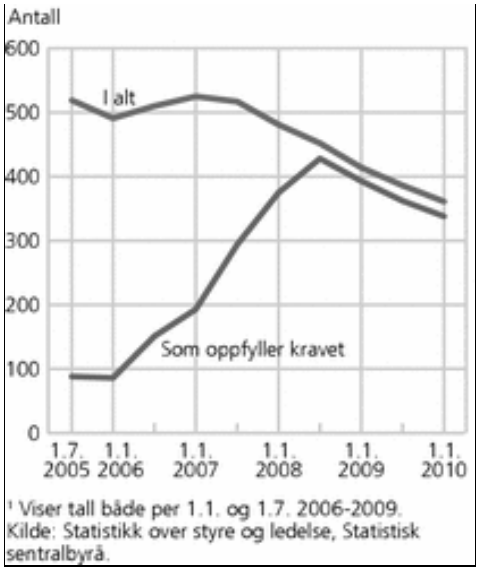

Figure 8: Number of ASA's overall (upper line), and those who fulfill the quota (lower line), yearly *(ssb.no, 2011).*

Researchers at the Institute for Social Research[3] (ISF) have tried to determine the cause for this significant decrease of Norwegian ASA's. According to Heidenreich & Engelstad (2010) at ISF, the decrease is not a consequence of the gender quota reform. They argue that the development in the number of Norwegian ASA companies must be seen in connection with a variety of reasons. The chief executive officers of 108 of the 126 companies that re-registered in 2007 and the beginning of 2008 were asked about the reason for these re-registrations (Heidenreich & Engelstad, 2010). Only eight of the companies answered that the gender quota reform was the reason for the re-registration. One can of course only speculate whether or not the companies that re-registered because of the reform would admit to it.

All in all, the reform is mentioned by 33 of the companies, but the majority state that the reform had nothing to do with the re-registration. The most common reason for the re-

[3] ISF: Institutt for samfunnsforskning (Institute for social research)

registration is change of ownership structure (mergers, acquisitions etc.), and changes in connection with a stock listing. Other companies list the change in the Securities Trading Act of 2007 as the decisive issue (Heidenreich & Engelstad, 2010). Starting November 1, 2007, trading companies did no longer need to be an ASA. This organizational form is the one who has the highest demands concerning conditions such as the size of the share capital, the number of board members etc., as well as the percentage of female board directors. For non-trading companies that have no intention of being publicly listed, the organizational form of an AS might be as well suited as ASA (Heidenreich & Engelstad, 2010).

3 Economic Mechanisms

Both Adams & Ferreira (2009) and Ahern & Dittmar (2011) have studied the effect women in the boardroom have on firm performance and valuation. It is generally agreed upon that the presence of women on boards could affect the governance of companies in significant ways (Adams & Ferreira, 2009). One of the leading positive arguments is based on the firm now being able to enhance their effectiveness by recruiting directors from an enlarged talent pool. On the other hand, research suggests that too much board monitoring can decrease shareholder value. According to Adams & Ferreira (2009), on average, firms perform worse the greater the gender diversity of the board is. In other words, gender diversity might only increase value in situations where it is already established that additional board monitoring will enhance firm value (Adams & Ferreira, 2009). Ahern & Dittmar (2011) expand these findings, and point out that it is difficult to distinguish whether outstanding board members increase firm value through their presence and actions, or if highly valued firms automatically attract these board members (Ahern & Dittmar, 2011).

Our main hypothesis is that more women on the board eventually will lead to more women in top executive positions. We believe that there are several reasons why there should be a positive spillover effect. First and foremost we believe that female board members will create awareness that there are talented and qualified women available for management positions. The gender quota reform may have contributed to disproving some of the possible prejudices male board members might have had against professional women. Furthermore, we believe that as the pool of female board directors increases, more women could act as role models and mentors to other aspiring women, thus creating a culture of women helping women upwards in the organization. Women with board positions could also more easily get access to valuable networks and become part of the inner circle of the organization, thus strengthening their

positions and opening up possibilities to climb higher on the corporate ladder. These aspects, along with other possible explanations for the spillover effect between female board and top management representation, will be presented further in the next sub-chapters.

3.1 Supply Side versus Demand Side Explanations

According to Reeves (2010), the board of directors of a company and its Chief Executive Officer are the most powerful positions in current business organizations. The lack of women in these positions makes an impact because boards make policy decisions that affect a large number of people, including shareholders and employees. This in turn reflects on the role of women throughout the rest of the corporation. The presence of women on the board also seems to have an effect on the number of women in top executive positions in companies (Bilimoria, 2006). This argument is based on a study of more than 440 Fortune500 Companies. The study compares the number of board directors in 1999 with the number of women officers in the same companies in 2000 (a one year lag). The results, based on linear regressions, show that these numbers are positively correlated (Bilimoria, 2006).

Women now comprise 47 percent of the overall US labor force. However, they only account for 6 percent of corporate- and top chief executive positions. There are many theories as to why there are so few women at the top, based on both supply side explanations and demand based barriers (Matsa & Miller, 2011). The supply side explanations are mostly rooted in gender differences regarding preferences and productivity. The belief is that some women shy away from the competition for promotions, while others choose to avoid the stress associated with balancing work and home production, especially if there are children involved. The demand side explanations are based on the "glass ceiling", and refer to barriers that prevent women from progressing to the highest corporate levels of the organization (Matsa & Miller, 2011). Matsa & Miller (2011) argue that these demand side barriers would suggest that there is a potential for women helping other women to advance on the corporate ladder. Furthermore, the central role of a company's Board of Directors is to appoint and oversee the company's executives, and hence, one should think that female representation on corporate boards could influence the gender composition of the companies' top executive management (Matsa & Miller, 2011).

To test this argument, Matsa & Miller (2011) analyzed data on corporate board members and top executives for a large panel of publicly traded US companies between 1997 and 2009. The results show that 64 percent of the companies in their sample had at least one woman on their

corporate board, but only 24 percent had a woman among their top five executives (Matsa & Miller, 2011). In general, female representation increased throughout the period; 7.2 percent for boards and 2.8 percent for top executives. The average female share of executives is compared to the previous year's female share of the company's board of directors, and shows that firms with more women on the board also tend to have more female top executives (Matsa & Miller, 2011). The regressions are controlled for factors such as the economy-wide trend of increased female participation in all facets of corporate leadership (Matsa & Miller, 2011).

3.2 The Double Bind – Stereotypes and Cultural Expectations

The arguments from Matsa & Miller (2011) are supported in a study performed by Catalyst in 2008. Catalyst analyzed the relationship between the percentage of women board directors in 2001, and the percentage of women corporate officers (defined as the highest-level executives in an organization) in the same 359 Fortune500 companies, five years later in 2006. Their findings show that there is a clear and positive correlation between the percentage of female board directors in the past, and the percentage of female corporate officers in the future (Joy, 2008).

Catalyst collected their data from publicly available annual reports. Furthermore, they conducted a regression analysis to examine the relationship between female board directors in the past and female corporate officers in the future (Joy, 2008). The analysis also controlled for factors that might impact the relationship, such as the percentage of female corporate officers in 2001, company rank, and industry (Joy, 2008). In order to test the nature and strength of the relationship, Catalyst divided the companies into quartiles based on the percentage of female board directors in 2001, and then compared the percentage of female corporate officers in 2006, in the first and fourth quartile. The average percentage of female board directors for each of the quartiles was also calculated. In addition to this, Catalyst tested whether the positive impact of female board directors on female corporate officers depended on a critical number of female on the board. To do this, three dummy variables were created, representing one, two, or three or more female board directors in 2001. The regression analysis based on these dummy variables resulted in a positive relationship between female board directors in 2001 and female corporate officers in 2006, for companies with two or more females serving on their boards (Joy, 2008).

Catalyst lists female board directors as a powerful antidote to break down stereotypes that devalue women's competencies. By introducing women to the boardroom, the women will get a chance to display their true abilities and business talent, and through this remove some of these negative stereotypes through which many women are being portrayed. If a woman performs well in the boardroom, it may lower the threshold for male dominated boards to both consider hiring, and actually hire women into the top positions in the organization. Catalyst also state that companies with more female board directors might have more inclusive work place cultures with programs that support the career advancement of women (Joy, 2008).

According to Rudman et al (2011), professional women that want leadership positions, face a double bind. In order to be perceived as qualified, they have to defeat gender stereotypes by presenting themselves as "agentic" – competent, confident, and assertive. The double bind is rooted in the women's need to first tackle the "lack of fit" between feminine stereotypes and leadership qualities. If they pass this initial barrier by acting "agentic", they still face a second hurdle; backlash. In this case, agentic women are perceived as capable, but even so, they risk prejudice and hiring discrimination for behaving counter-stereotypically. Consequently, this backlash forces women to choose between being respected and being well-liked, the latter undermining their ability to obtain positions of status and power (Rudman et al., 2011). It is not clear whether the women that progress to the board room and the top executive managements of firms are viewed as likeable or competent.

This view is supported by Basow (2011) who states that the cultural expectations of women, such as being sensitive and kind, only partially overlap with the cultural expectations of leaders, such as being assertive and dominant. On the other hand, there is a major overlap if you compare the cultural expectations for men and for leaders. Women who display traits of expected leaders risk being looked upon as unfeminine, while female professionals who display the typical traits expected of women, risk not being considered as having the relevant leadership qualities (Basow, 2011).

Furthermore, evaluators of professionals, for example the people in charge of recruiting candidates to top positions, tend to use different standards when judging women and men (Basow, 2011). Men set the standard, because the norm is that leaders are male. Consequently, female leaders must often work harder to be perceived as equally as competent as their male counterparts, and not to just be judged by what is "expected of a woman". In addition, women may also face an indirect disadvantage through these expected standards.

According to Basow (2011), it appears that women tend to be evaluated against other women ("she is really assertive *for a woman*); while men tend to be judged according to a more absolute standard (he is really assertive). It is also likely that the absolute standard is more prominently used as a basis for hiring decisions (Basow, 2011).

3.3 Female Role Models

Female board members could also act as role models and leading figures to other women that see the possibility to have influence on the organization. A role model is defined as an individual whose behavior, personal style and specific attributes are emulated by others (Sealy & Singh, 2010). According to Sealy & Singh (2010), the lack of senior female role models continues to be a key barrier to the successful careers of women. There are still too few women at the top to act as examples, and it may take many years before there is a substantial pool of female role models at the executive level. They also argue that women are inspired by outstanding women, although not by outstanding men. In addition, female role models are predominantly inspiring in circumstances or situations where they are in a minority, as they clearly are in the top executive management (Sealy & Singh, 2010).

If some women have cleared the path upwards in the organization, it may be easier for other aspiring women to follow in their footsteps. It is also possible that the introduction of the gender quota reform could have a symbolic value in the sense that it creates a breach in the traditional male dominated business hierarchy. The gender quota reform has led to an increased female presence in boardrooms, which in turn could create spillover effects to other parts of the organization, in particular the top executive management group. Once women are well represented in the boardroom, it might also be easier for them to influence the decision to recruit other women into top positions.

3.4 Mentoring; Important for Men, Essential for Women

Another aspect related to role modeling, is the effect of mentoring. Mentors, both male and female, are defined as "higher-ranking, influential, senior organizational members with advanced experience and knowledge who are committed to providing upward mobility and support to a protégée's professional career" (Linehan & Scullion, 2008). Mentorship is an important tool for upward professional progression in the organizational hierarchy (Hunt & Michael, 1983). This is based on the fact that mentors often have an important influence on promotion decisions. In addition, it has been reported that those who are mentored often enjoy

higher salaries, greater awareness of their organization, as well as a higher rating of employment satisfaction than those who are not mentored (Høigaard & Mathisen, 2009).

Research suggests that mentoring relationships may be important for men, but *essential* for women, because they face greater organizational, interpersonal, and individual barriers to professional advancement (Linehan & Scullion, 2008). Mentors are especially important in order for women without family connections to reach the top executive positions. According to Linehan & Scullion (2008), a large part of the women in top executive management list mentorship as a critical factor to their success. However, the number of female role models and mentors is limited, and thus it might be difficult for women to take full advantage of this kind of working relationship.

Hunt & Michael (1983) refers to Levinson et al. (1978) who concluded that mentors and protégés need to be of the same sex, due to similar attributes, beliefs, values, and social factors. Even though this hypothesis is not fully supported, other researchers have also touched upon the subject. According to Hunt & Michael (1983), Bowen & Zollinger (1980) found that female protégés did not identify with male mentors, and consequently they did not develop efficient professional relationships. More women on the board could lead to more female mentors. Research has shown that people who are mentored are likely to become mentors themselves, thus creating a positive chain reaction (Hunt & Michael, 1983).

This theory is also supported by more recent research. A survey commissioned by the Committee of 200 (C200) suggests that increased access to mentoring for women may be an important step toward achieving more gender equality (Blake-Beard, 2003). Furthermore, research from Catalyst suggests that women feel that mentoring is critical to their corporate success, and it turns out that mentoring is significantly connected to career-related success. The same study reveals that lack of access to mentoring is one of the most prominent barriers to career advancement (Blake-Beard, 2003). At the beginning of any career, advancement often happens naturally. This progression has a tendency to last until middle management, a point in the career where women are more likely to encounter the glass ceiling. To prevent this from being the final stop on the corporate ladder, a mentor might provide crucial insight on how to overcome these barriers to career advancement (Wellington & Spence, 2001).

Consequently, if more women on the board could lead to more women in positions where they may act as mentors, more women could get the opportunity to be mentored. This could increase the chance for these women to reach the next level on the corporate ladder.

There is, however, also some theory that suggests that there are difficulties when dealing with women mentoring women. The "queen bee syndrome" occurs when women in top executive positions are unwilling to mentor other aspiring females (Blake-Beard, 2003). The main reason for this lack of support to female subordinates is the queen bee's fear that the success of other women may challenge their own position of power in the organization (Warning & Buchanan, 2008). In addition to this, queen bee's tend to get along with male executives because they practice the same behavior and discriminate against other women, thus maintaining a status quo; adjusting to the glass ceiling and sustaining the male dominated power structure (Geyer-Semple, 2011).

In addition to the queen bees, there might also be a problem with so-called "token" women on the boards acting as bad mentors. Theory suggests that when the percentage of representation in a community (the board) falls below 15 percent, due to their scarcity, the minority is seen as representing their category (women) rather than being seen as individuals. When women are in a minority in large companies they are said to be "tokens" (Singh & Vinnicombe, 2004). In the situations where women are elected as tokens rather than qualified individuals, they may not be competent enough to act as mentors. In addition, there might be an unfortunate signaling effect. The token women on the board are not there because they have proved qualified, but because of their gender, and hence the positive role modeling effect might vanish.

On the other hand, according to Huse & Solberg (2004), tokenism does not necessarily have to be a bad thing even though the women constitute a clear minority within the board room. They support this hypothesis with data collected from eight female directors with experience from more than one hundred corporate boards. The women, as tokens, received a great opportunity when becoming a board member and could potentially advance upward in the organization (Huse & Solberg, 2004). Some of the women clearly stated that they would never have reached the position they have today if the board had not needed women as tokens. However, being selected as a token comes with great pressure. The women face several barriers and often have to prove their competence in other ways than their male counterparts. By doing their work well, the women got to influence decision-making, improve their status as directors, and gain valuable board experience (Huse & Solberg, 2004).

3.5 Socialization and Networks

A large part of the recruitment process is based on socialization, in which people that are part of the "natural inner culture" of an organization are more likely to be the ones promoted. Socialization is defined by Yasin & Helms (2007) as the act of training a person to fit into a particular culture or environment. Historically, the first members of upper management were men. Hence the corporate culture and formal and informal training programs were developed to socialize men (Yasin & Helms, 2007). The recent increase of women on the board could give them the opportunity to adapt to the organizational culture, and through this become part of the informal network used to promote individuals to top positions.

Networks can be defined as interconnected systems of people (Reeves, 2010). According to Reeves (2010), women can increase their chances of climbing the corporate ladder by establishing professional relationships or by joining network groups. Networks can be seen as sources of information concerning possible job opportunities, as well as a pool of influential contacts that can help women advance in their careers. It is, however, important to remember that networks can create barriers such as keeping out talented "outsiders". Women need to understand the concept of the social networks to be able to use them to their advantage and to avoid the possible obstacles they can create (Reeves, 2010). As mentioned earlier, securing a mentor could be an important first step for women to enter a formal network to help guide and expand their careers.

One could, however, argue that socialization is complicated for both men and women. It may be likely that after the reform, a more prominent conflict could arise between older and younger workers due to the fact that older workers are more stuck in socialization patterns. Nevertheless, this could still favor the older males sitting at the top of the hierarchy in many firms. When Ahern & Dittmar (2011) studied female board members through univariate tests and instrumental variables regressions, they found that the "new" female board directors were substantially different compared to the existing male directors. The females were more highly educated, had significantly less CEO experience, as well as being younger than their male counterparts (Ahern & Dittmar, 2011). In other words, this distinction between younger and older worker might in reality be a distinction between female and male workers.

3.6 Cross-sex Bias

During the last decade, there have been several discussions regarding why gender differences arise in terms of top management positions. One of the problems concerning these differences

is that they seldom manifest themselves through overt and conscious acts of discrimination against women. The barriers are often subtle, consequently making them difficult to reveal, and in turn, difficult to remove (Kunze, 2011). One example is the perception that exists that men make better bosses than women. This perception is, however, mostly shaped by the fact that the majority of men have never experienced a female boss (Kunze, 2011).

This view is studied by Elsesser & Lever (2011). They present a US-based national survey of more than 60, 000 employees and their preferences for male or female managers. One result of the study revealed a cross-sex bias in the ratings of the employee's *current* managers; men judged their female managers more favorable and women judged male managers more favorably. However, the largest effects were found when the participants were asked about which gender they would prefer to work for, *in general*. The majority stated no preference, while 33 percent preferred a male manager, and only 13 percent preferred a female manager (Elsesser & Lever, 2011).

One of the initial hypotheses in this survey was that employees in male dominated environments (who had never before experienced a female manager) would prefer male managers, while employees in female dominated environments would prefer female managers. This hypothesis was supported by the people employed in architecture/engineering preferring male managers, and those in personal care and social services preferring female managers. Furthermore, those employees who currently reported to a male manager were more likely to prefer male managers. In addition, the employees who had never worked for a woman were more likely to prefer male managers. Somewhat surprising, a larger percentage of women preferred male managers, even some of the women who were currently managers themselves, were more likely to prefer male managers (Elsesser & Lever, 2011).

The respondents were also asked to justify their preferences. The most common justification for preferring male managers centered upon some negative attributes of female managers. Popular keywords used to describe female personality traits were emotional, moody, dramatic, jealous, petty etc. None of these descriptions appeared in the description of male managers. Also, several women reported that they preferred male managers because of too much competition with female managers. Others disliked female managers because they think that women need to prove themselves worthy of the management role (Elsesser & Lever, 2011).

4 Methodology

This chapter presents our methodological approach. As to any research approach, there will be both advantages and disadvantages. There is a fine balance between the optimal choice of design, and limitations such as time and feasible scope. Our choice of research design is consequently based on what we think is the most suitable for our work.

4.1 Research Design

We want to test whether there is a relationship between the percentage of female board members in 2004, right after the gender quota reform was signed, and the percentage of female top executives in 2010, two years after all the ASA's met the requirements of the reform.

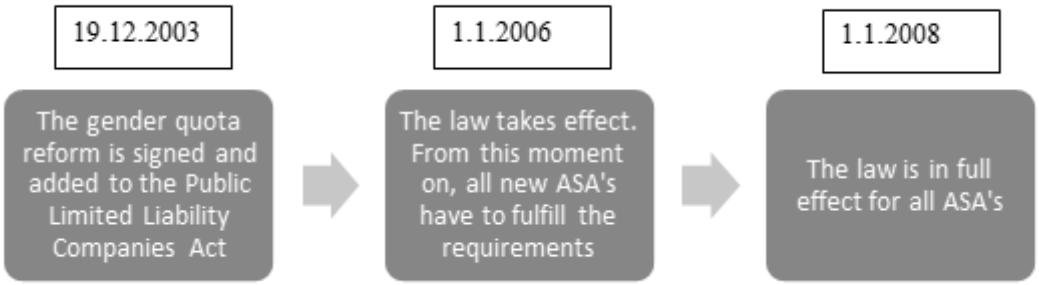

Figure 9: The most important dates in the development of the gender quota reform

The reason we have chosen 2004 is that we needed to observe outcomes from before the gender quota reform took effect in 2006. Because the reform was signed at the end of 2003, we wanted to observe the outcomes of a year that was as close as possible to when it was signed (see Figure 9). From this point on, the companies would have to make conscious decisions about the composition of their Board of Directors. As the data set we received did not hold the same quality for 2003 as it did for 2004, we chose to use the outcomes from 2004 in our analyses. By choosing 2004 we can potentially see the full effect of the reform.

We chose to compare the outcomes from 2004 with outcomes from 2010, because we needed to look at a year after the law took full effect. The outcomes of the reform might take some time to surface, and as a consequence, we wanted to locate information from a year as close to present time as possible. The information we needed is located in the companies' annual reports. These reports are often published during the second yearly quarter, and due to the time constraints of this master thesis, we would not be able to access the information from

2011 in time. As a result, we found that 2010 is appropriate, because it is the year that is closest to today that we were able to locate the necessary information from.

It would also have been interesting to compare the share of female top executives in 2004 with the share of female top executives in 2010, to see how these numbers have developed. However, these numbers are difficult to collect. It is not common to have annual reports dating as far back as 2004 available online. In order to collect this information we would have had to contact every firm individually, but this did not appear as a feasible solution due to the time constraints of this master thesis.

4.2 Data Collection

The data we are working with are secondary data. This means that we want to reanalyze data that has already been collected for some other purpose (Saunders et al., 2009). Early in the data collection process we received a data set from our supervisor. This data set was in Excel® format, and contained information on the composition of the boards of Norwegian ASA's from 1998 to 2010. We went through the data set and prepared a list consisting of all the ASA's that were in business from 2004 and through 2010. The reason for this selection, is that in order for us to be able to see whether the gender composition of the board in 2004 has an effect on the share of women in the top executive management group of the same firms in 2010, we can only include the companies that were actually in business all the years from 2004 through 2010. This process left us with a sample of 30 firms. We proceeded by dividing the firms into two groups based on the number of women on the boards. Next, we went online to the company websites to locate their annual reports for 2010. The purpose of this was to locate the information we needed regarding the composition of the top executive management group of the companies in our sample. However, this proved to be quite difficult as a lot of the firms did not have any information regarding their top executive management in their annual reports. There were also problems with some of the subsidiaries, as we often could only locate the annual reports for the parent companies. As we did not end up using this particular approach, we have chosen to include the details surrounding this in Appendix 1.

Based on this lack of available information, we came to the realization that our sample was too small to be representative. We also felt that the initial number of only 30 firms seemed to be low, and thought that some information might have been missing from the first data set we received. Consequently, we received a second data set from our supervisor. This data set contained additional information regarding the composition of the boards, now including all

Norwegian ASA's in the given time period. Because the data from the new file was stored in an undesirable format, we decided to assemble a list directly from "Brønnøysundsregisteret". This was a list of all Norwegian ASA's in the register, and it consisted of 309 firms. We proceeded to eliminate all the companies that were registered after 2004, and were left with 182 firms, which also seemed to be a more plausible number of firms compared to our first sample of 30 firms. This elimination was based on our previously mentioned need to locate firms that existed in a given year after the gender quota reform was introduced.

Subsequently, we received a data set from a department at NHH; the Institute for research in Economics and Business Administration (SNF). SNF, in turn, received their data from "Brønnøysundsregisteret". The data set from SNF contained a substantial amount of information on all Norwegian companies from 1992 to 2009, including both "Foretaksvariabler" (business variables) and "Regnskapsvariabler" (accounting variables). All the data were in STATA 12 format.

Because the data set from SNF contained a tremendous amount of data that we did not need for our thesis, we proceeded by creating a new variable in STATA; "selskf_new". This allowed us to extract all the ASA's in the data set. These companies are the only ones affected by the gender quota reform, and hence they are the only ones of interest to us. Furthermore, we merged the list of companies we collected manually from "Brønnøysundsregisteret", with the data file from SNF. This gave us an outcome of 182 companies appearing in both data sets and thus creating the basis for our final sample.

We have chosen to look at the fixed members of the board of directors. This means that we have excluded the deputy board members in our calculations. The same rules on gender equality that apply to fixed board members, also apply to deputy board members isolated, but the reason for our exclusion of the deputy members is that they do not affect the percentage of fixed female board directors. In addition to this, deputy board members have limited decision-making authority; hence their influence on promotional and hiring decisions regarding the top executive management group of the firm is relatively limited. Some of the data in the SNF data base regarding the number of women on the boards was reported as a dot instead of a number. According to the SNF report this indicates that the values are missing. To solve this problem we went back to the second data set we received from our supervisor to locate the numbers for these missing values. As it turned out, all the dots represented the value zero, meaning that there were no women present on these boards. The SNF data set did not contain

information regarding the top executive management group of the companies, and consequently we had to locate this information elsewhere.

One of the main challenges has been to conduct a sample. Due to limited time, we were not able to collect information on all the 182 firms. Initially, we wanted to use a random sample, withdrawing approximately 40 percent of the population. However, it soon became evident that a lot of the information we wanted regarding the top executive management group was not possible to locate through the company's annual reports and websites.

4.3 Data Description

4.3.1 Definition of the Top Executive Management Group

While collecting information on the top executive management group for the various firms we discovered that a lot of the firms define their top management differently. For example, some firms operate with a Chief Executive Officer and "Directors" for the other executive positions (Director of Economy), while other firms use terms such as "Managers" (Sales and Marketing Manager) or "Head" (Head of Strategy). Some firms only include their CEO in the top executive management group, while others also include geographical department managers.

To solve this problem, we decided to look at each firm individually. Some firms have clearly defined who is included in their top executive management group in their annual reports, and in these cases we followed their definitions. In the cases where the companies have not clearly defined their top executive management group, we looked at organizational charts, making it possible for us to make thorough decisions based on a desire to achieve a high degree of similarity in the definitions. This similarity is not based on the official titles, but rather on whether we perceive the position to be a natural part of the top executive management group in a specific company. (For example, depending on the size of the company, all directors are not necessarily included). As there are no rules describing what positions a top executive management group needs to consist of, and because the firms vary so much in their own descriptions, we found this individual assessment to be the best solution.

We thought about personally contacting the firms we could not locate information about, and ask them about their top management composition. However, we were unsure of the quality of the information we might receive. With this approach, we would risk facing a measurement error problem. We would have no control over who answered our request, and on what information the reply would be based on. In the firms that do not have a clearly defined top

executive management group, the person in charge of answering the request would face the same dilemmas as discussed in the previous paragraph regarding which positions to include. Furthermore, it might have taken a lot of time for the firms to reply to us, and worst case scenario, we might not have received any answers at all.

Our final sample is based on the 88 firms where we were able to locate information on the composition of the top executive management groups, without any external assistance. This turned out to be approximately 48 percent of our original sample, and we regarded this to be a feasible solution (for list of companies, see section 8: Attachments).

4.3.2 Description of Main Variables

After careful consideration, we included the following business variables from the SNF data base in our analysis:

Variable	Description
"**orgnr**"	9 digit organizational number, assigned to the company at the time of registration in "Brønnøysundsregisteret"
"**navn**"	The name of the company
"**selskf**"	The form of business, divided into main categories depending on the responsibility and role of the owners
"**aar**"	The year of reporting
"**st_medl**"	The number of fixed board members in the company, excluding deputies, observers and chief executive officer
"**st_kvimdl**"	The number of fixed female board members in the company
"**bransjegr**"	The business sectors that the companies operate in

Table 2: Description of main variables included from the SNF data base

Traditionally, some employment sectors have been male or female dominated. In the data set we received from SNF, the companies were divided into 11 different sectors ("bransjegr"). We used these sectors to generate a dummy variable called $I\_sec_{i(1\text{-}11)}$, which we then used as a control variable in our main regression (see Appendix 3 for a list of the different sectors). We also created a dummy variable "group_low2004". This variable has the value 1 if it represents a company in the "low" group, and the value 0 if it represents a company in the "high" group. Furthermore, we generated the variable "boardsize" (based on the variable "st_medl"), as we wanted to control for the number of seats on the board. Table 3 presents summary statistics for the variable "boardsize":

Summary statistic, "boardsize"						
Observations	Mean	Std.Dev.	Min. value	Max. value	95 % Conf.	Interval
88	6.784	2.0311	3	11	6.3537	7.2144

Table 3: Summary statistics, "boardsize"

We also created a new variable called "nrofemployees" in order to import some external, hand collected information into our data set. This includes the fixed number of employees in each of the 88 firms in our sample in 2010. Although there was some information regarding this variable in the SNF database, we found that this information did not hold the necessary quality. According to the SNF report there was uncertainty regarding whether the numbers they had received were reported as the actual number of employees or number of man-years. A lot of the data was also reported as missing.

Ideally, we would have wanted these numbers from 2004, but most of the companies do not have the annual reports from 2004 still available for the public to access. Because all the firms in our sample have published their annual reports for 2010 online, we decided to use this year as the basis for our data on number of employees. We are aware that these numbers might not be representative compared to the numbers from 2004, as a lot of staff changes might have occurred during those six years. However, we still think the numbers give us a reasonable measure of which size category the firms belong to. Table 4 presents summary statistics for the variable "nrofemployees".

Summary statistic, "nrofemployees"						
Observations	Mean	Std.Dev.	Min. value	Max. value	95 % Conf.	Interval
88	3107.364	6321.095	0	33000	1768.051	4446.676

Table 4: Summary statistics, "nrofemployees"

4.3.3 Categories Based on the Gender Quota Reform

We thought that it would be interesting to see how the companies in our final sample distributed themselves if we divided them into the five groups based on the requirements of the gender quota reform. As mentioned earlier, there are different requirements regarding gender composition on the board depending on the size of the board. This did not turn out to be a feasible approach, as some of the categories contained too few firms to get any reasonable estimates. See Appendix 2 for details regarding this distribution.

4.3.4 "Low" and "High" Group of the Final Sample

In the end, we decided to divide the companies in our final sample of 88 firms into two groups. The two groups are categorized as "low" and "high", where "low" refers to the

companies with less than 15.07 percent female representation on the board in 2004. Accordingly, "high" represents the companies with female board representation above this measure. The value 15.07 equals the 2004 mean percentage of female board directors of our final sample. We chose to draw the line at 15.07 percent because of technical reasons. As shown in table 5, this left us with a "low" group consisting of 45 firms, and a "high" group consisting of 43 firms.

	"Low"	"High"	Total sample
Number of firms in each group	43	45	88
Mean female percentage of each group	3.08	26.53	15.07

Table 5: Number of firms in "Low" and "high" group

As we recall from Figure 5, the mean percentage of female board directors in 2004 in all Norwegian ASA's was 9.0 percent. If we were to use this number as the cut off rate, the two groups would be unevenly distributed (31 / 57). The "low" group would also only consist of firms with zero percent female representation. We believe it is more plausible to divide the groups as evenly as possible, in order for the means of each group to be comparable.

The reason we have divided our sample into these two groups is because we want to see if there has been a difference in the development of female executives depending on how many women that were present on the board right after the law was signed in 2003. Our hypothesis is that the firms with higher female board representation in 2004 will have a higher female executive representation in 2010. As mentioned in the chapter on economic mechanisms, there is reason to believe that having women on the board could lead to spillover effects into top management due to a number of reasons.

Furthermore, we believe that the firms with low female board representation in 2004 might have a lower female executive representation in 2010. It might be the case that it takes these firms more time to adjust to an increased female representation. Initially, these firms had to attract women to their boards to fulfill the requirements of the quota, and it might be natural to assume that it might take longer for any spillover effect(s) to surface in these firms.

5 Empirical Analysis

5.1 Descriptive Statistics

The analyses in this thesis have been conducted in Excel and STATA 12. The data we received from SNF were in STATA 12 format, and thus we decided to continue using the

same software. We mainly used STATA 12 for our regression analyses, while we did the graphical presentations in Excel. This chapter will present our empirical results, and these findings will be elaborated further in the discussion chapter.

As mentioned in the methodology chapter, we have created our sample based on information from "Brønnøysundsregisteret". After completing the sample selection process we were left with a final sample of 88 ASA's that existed in all the years from 2004 through 2009.

General overview of the sample

To get a general overview of our data, we started out by creating a few graphs to illustrate some basic points. Firstly, we wanted to take a closer look at our final sample consisting of 88 Norwegian ASA's. Table 6 presents summary statistics for the development of the percentage of female board directors in all the 88 firms, from 2004 through 2009:

Summary statistic, "percentage of female board directors, 2004-2009"							
Year	Obs	Mean	Std.Dev.	Min.value	Max.value	95 % Conf.Interval	
2004	88	0,1507	0,139	0	0,4545	0,1213	0,1802
2005	88	0,2179	0,156	0	0,5	0,1848	0,251
2006	88	0,2951	0,1473	0	0,6	0,264	0,3263
2007	88	0,3775	0,1002	0	0,5714	0,3563	0,3988
2008	88	0,407	0,0748	0,25	0,6	0,3911	0,4228
2009	88	0,3974	0,0718	0,25	0,5714	0,3822	0,4126

Table 6: Summary statistics, female board directors, 2004-2009

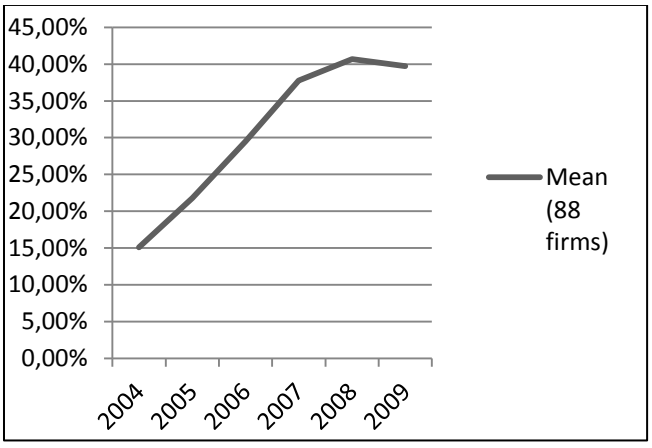

Figure 10: Mean female percentage, final sample of 88 firms, balanced panel

Figure 10 shows the development of the mean percentage of female board members in the 88 firms from 2004 to 2009. As we can see, there has been a steady increase since the gender quota reform was signed in December 2003, and the goal of 40 percent women on the board was reached in 2008. However, it is important to remember the details of the law that states that firms with small boards do not need to obtain 40 percent women on the board, as long as

both genders are represented. This means that all the firms could be meeting the requirements of the law even though the mean of female board representatives is lower than 40 percent. Table 6 also shows the minimum and maximum female board percentages each year, and we can see that there were still firms with 0 female board members as late as in 2007.

Next, we wanted to see whether or not the average percentage of women on the board and the standard deviations of our final sample were significantly different from the corresponding values of all the 182 ASA's that existed from 2004 to 2009. As we can see from Figure 11 and 12, the averages are approximately equal. This illustrates that our sample of 88 firms is relatively representable compared to the ASA population.

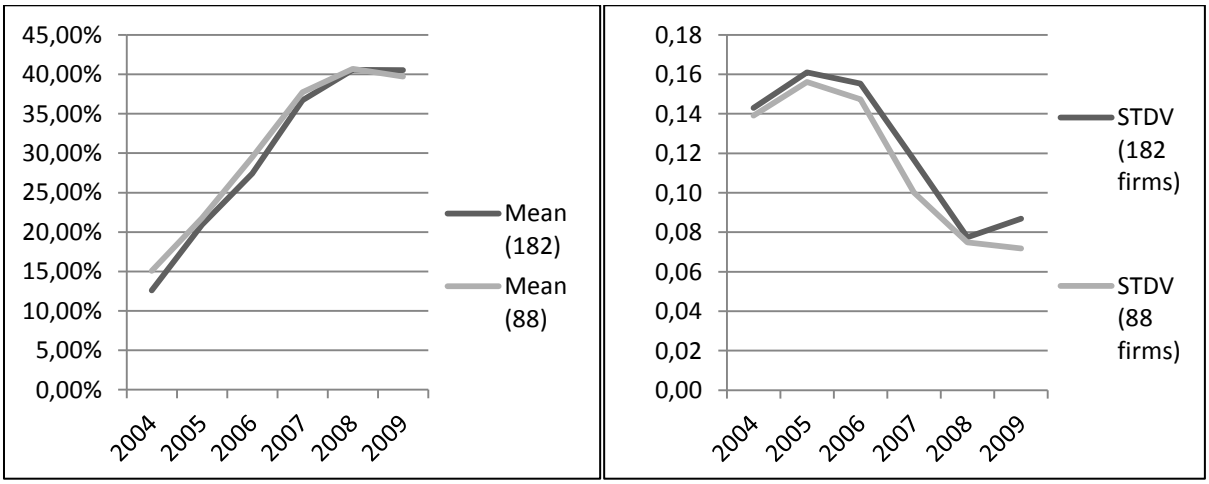

Figure 11 (left): Comparison of mean percentage of women on the board[4]
Figure 12 (right): Comparison of the mean standard deviation of the two groups[5]

To further control the representativeness of our sample, Table 7 illustrates the differences in average board size:

	Sample 88 firms				Sample 182 firms			
Year	Mean	Std.dev.	95% confidence interval		Mean	Std.dev.	95% confidence interval	
2004	6.55	2.10	6.1	6.99	5.81	2.07	5.5	6.11
2005	6.78	2.02	6.35	7.21	6.01	2.08	5.7	6.31
2006	6.93	1.97	6.51	7.35	6.12	2.03	5.82	6.42
2007	6.81	1.86	6.42	7.21	6.04	1.97	5.75	6.33
2008	6.84	1.83	6.45	7.23	6.03	1.98	5.74	6.32
2009	6.78	1.82	6.4	7.17	5.93	2.02	5.63	6.23

Table 7: Board size: mean, standard deviation, and confidence intervals, yearly

[4] Comparison of mean percentage of women on the board in our final sample of 88 firms with the total available sample of 182 firms
[5] Comparison of the standard deviations of our final sample of 88 firms with the total available sample of 182 firms

As we can see from Table 7 there are minor differences when it comes to average board size between the two samples. Our final sample of 88 firms has a slightly higher average than that of the sample of 182 firms. According to these numbers, one could say that our sample of 88 firms does not differ enough in board size from the total sample, to make it unrepresentative. Our sample of 88 firms has a lower standard deviation than the total sample, but the differences are relatively small. In 2004, which is the year we are using when we compare the share of women on the board with the share of female top executives in 2009, the values are approximately equal.

As mentioned in the institutional background, Statistics Norway has presented a similar graph of the share of women on the boards in Norwegian ASA's from 2004 to 2009. In order to compare these graphs we found it to be helpful to place them all in the same figure. However, the graph from Statistics Norway did not supply the actual numbers that were used, so to illustrate our point we have made an estimate of this graph based on careful measurement by eye. This estimate is shown as the stippled line in Figure 13;

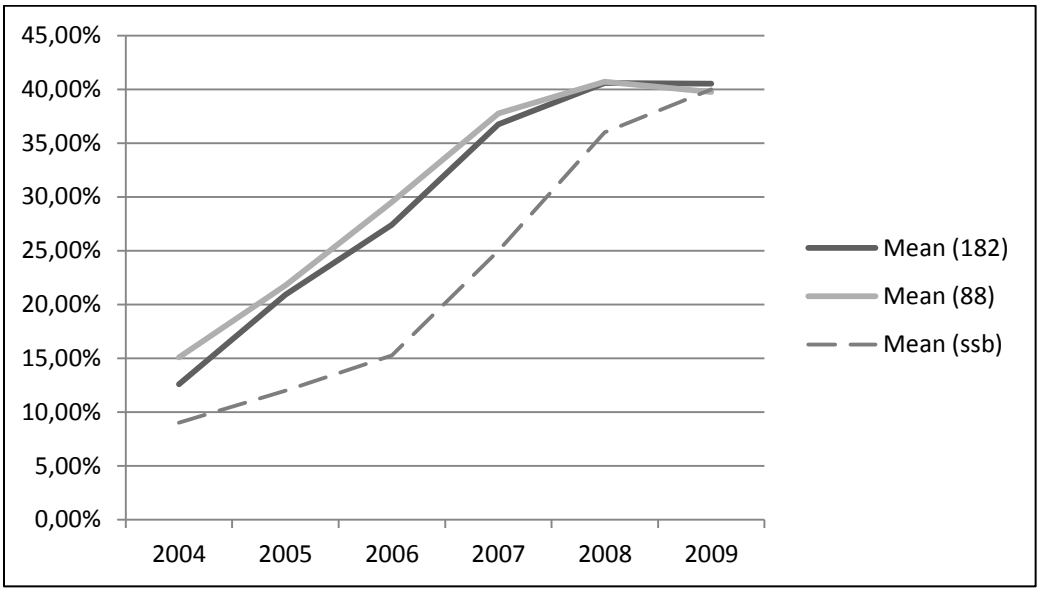

Figure 13: Comparison of mean female board representation, including graph from Statistics Norway (ssb)[6]

The shape of the graph from Statistics Norway differs substantially from the graphs from our population. As we can see Statistics Norway has reported a lower mean of female board representation than what we find to be the case in both the overall population of 182 firms and

[6] Comparison of mean percentage of women on the board in our final sample of 88 firms, the total available sample of 182 firms, and the corresponding numbers from Statistics Norway

in our final sample of 88 firms. As we do not have any information regarding what data their graph is based on, we can only presume what the reason(s) for this difference is.

One reason could be that Statistics Norway has not included ASA's from the public sector. Traditionally this sector has had a higher percentage of female employees compared to the private sector. It could be natural to assume that there also would be a higher percentage of females in the boards of these companies. If one does not include the firms in the public sector in the calculations, the mean female board percentage will become lower. Furthermore, we went through the list of all the ASA's that existed in Norway from 2004 to 2010. We chose to remove the ASA's that did not exist in all these years and were left with 182 firms. It is possible that Statistics Norway has included all the ASA's that existed in a given year in their calculations. This would cause them to have a much higher number of firms to draw the mean from every year. For example, at the end of 2007, the total number of ASA's registered in Norway was well above 450 firms.

During the time period, several firms chose to re-register from ASA to AS. There is a possibility that some of these firms had problems fulfilling the requirements of the new gender quota reform. If this is the case, and these firms were included in the calculations from Statistics Norway, this would also cause the mean female board percentage to be lower than what it is in our sample. One last aspect could simply be that Statistics Norway have measured their numbers at different points of the year than we have, thus causing a possible difference in the numbers. SNF presumes that the data we have used in this thesis has been reported at the end of each calendar year.

After this initial look at our sample, we will now turn to our empirical results. We want to test whether there is a positive relationship between the percentage of female board members in 2004, right after the gender quota reform was signed, and the percentage of female top executives in the same companies in 2010. To start off with, we conducted a regression analysis on our final sample in order to get a general sense of whether there is a relationship between the two variables or not.

Dependent variable: Female share of top executives in 2010	
	(1)
Female share of board directors in 2004	0.7776***
	0.1463
_cons	3.0184***
	2.9921
Observations	88
R-squared	0.2472
Adj. R-Squared	0.2384
*** p < 0.01, ** p < 0.05	
Notes: Standard errors reported in italics. (1) reg top2010 board04	
top2010: female share of top executives in 2010	
board04: female share of board directors in 2004	

Table 8: Main results 1: Regression of final sample 88 firms, *top2010 board2004*

According to Table 8, every company has a top executive management group with at least 3 percent female representation regardless of female board representation. Furthermore, the female percentage in the top executive group will increase with 0.78 percent for every additional percent of female representation on the board. The coefficient of determination (R-squared) is 24.72 percent. The p-value is zero percent. This means that one can say with absolute certainty that the female board percentage is having some effect on the female top management percentage.

5.2 Main Empirical Results

5.2.1 The Estimation Approach

In the chapter on economic mechanisms we presented several hypotheses as to *why* there should be a positive relationship between the percentage of female board directors and the percentage of female top executive managers.

Our main empirical strategy is to compare the companies with a “low” and “high” female board representation in 2004, to see if they have different fractions of female top executive managers in 2010, after the introduction of the gender quota reform. As mentioned in the methodology chapter we want to see if the female representation in the top executive management is affected by how many women that were present on the board before the gender quota reform took full effect. When dividing the two groups, we drew the line at the average percentage of women on the boards in 2004 which was 15.07 percent. This left us with a “low” group consisting of 45 firms, and a “high” group consisting of 43 firms.

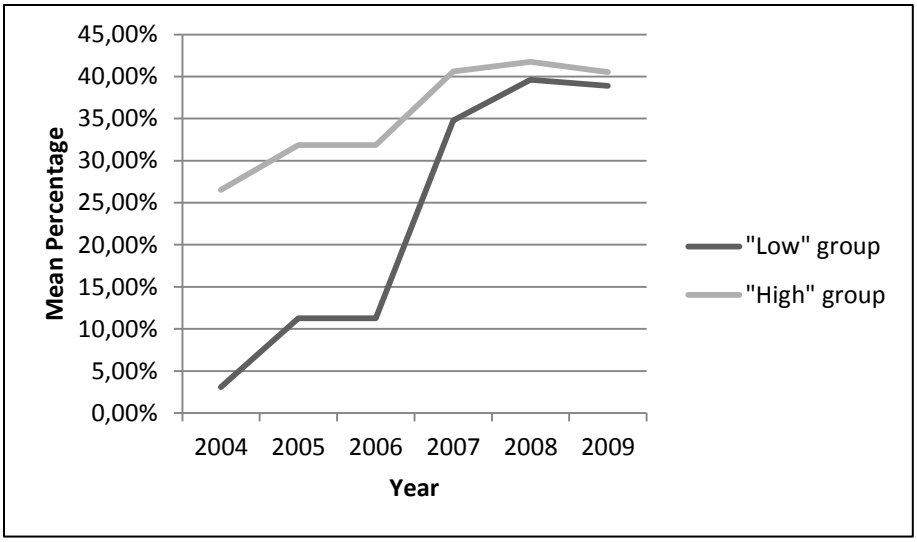

Figure 14: Mean percentage of female board directors for "low" and "high" group

Figure 14 shows the mean percentage of female board directors for the two groups, yearly. As we can see, the "high" group consistently has a higher average percentage than the "low" group. The percentage for the "low" group increases drastically between 2006 and 2007, and in 2008 and 2009 the two groups have an approximately equal average percentage. Because we divided the two groups based on the share of women present on the board in 2004, this is a natural progression. It also makes sense that the mean of both groups center around 40 percent in 2008 and 2009, as this was the level the quota required all the ASA's to reach by 2008.

Furthermore, we chose to take a look at the two groups individually and see how the percentage of women is distributed amongst the different firms. The following two figures provide a graphical representation of the "low" and "high" group respectively:

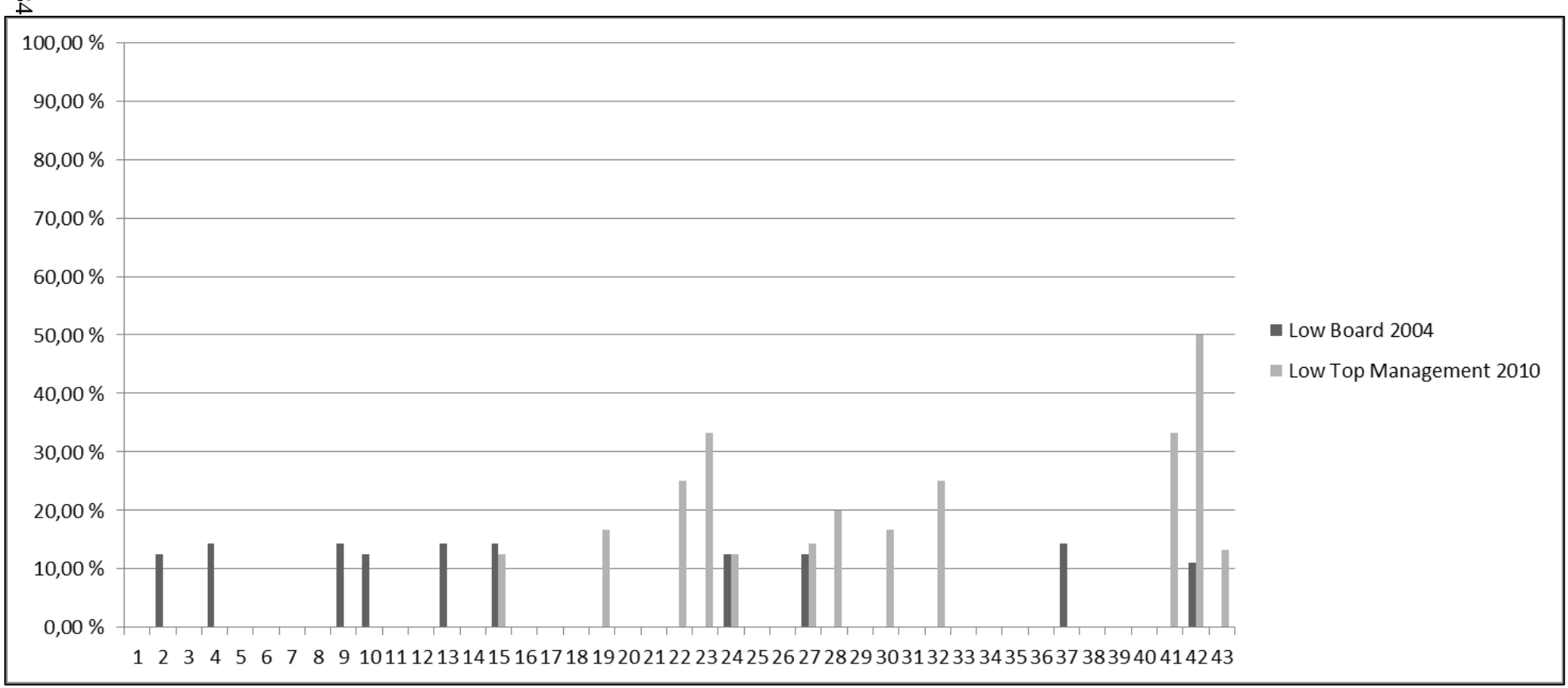

Figure 15: Female board (2004) and top management (2010) representation for each firm in the "low" group.

In the “low” group the results are very irregular. Some firms have female board representation, but no female top executive management representation. For other firms the situation is reversed. Few firms have female representation both in the board in 2004 and in top executive management in 2010. It is also worth noting that relatively many firms have no female representation either on their board or in their top executive management.

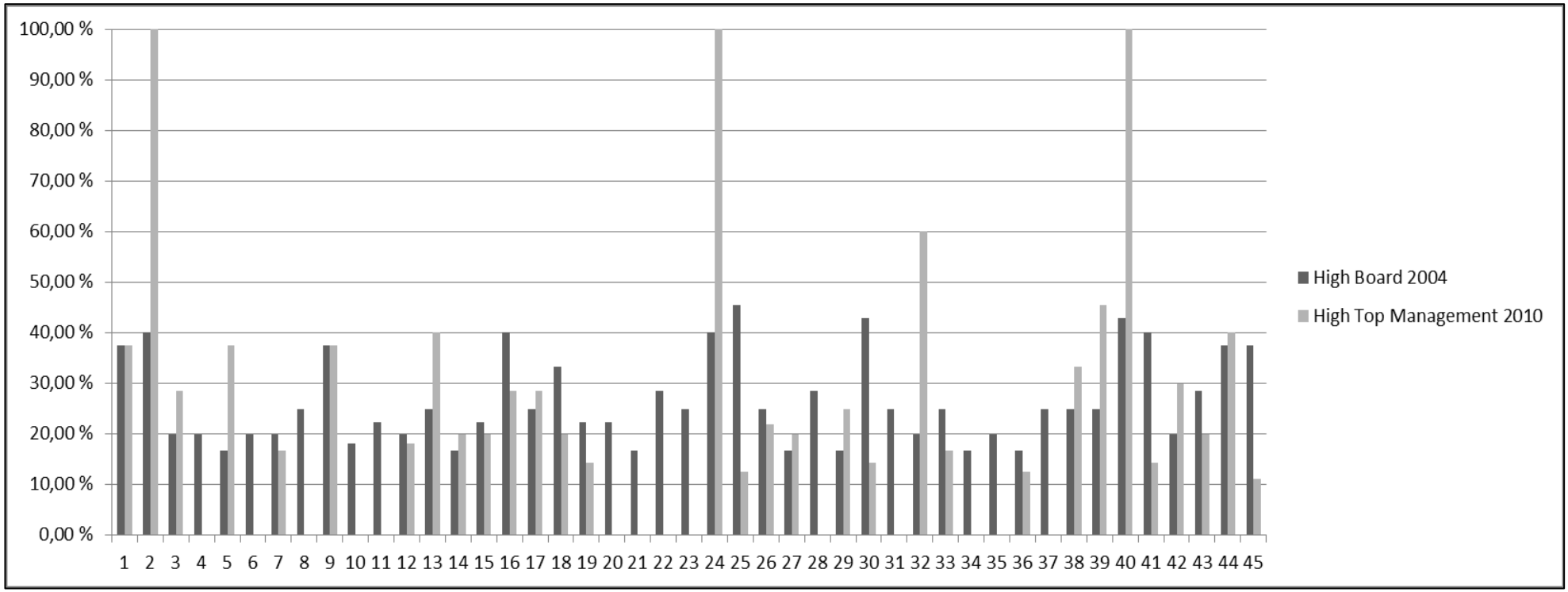

Figure 16: Female board (2004) and top management (2010) representation for each firm in the "high" group.

We have already established that the firms in the "high" group have more than 15.07 percent female board representation. Most of the firms also have female representation in their top executive management in 2010. For half of the firms the percentage of female representation is approximately the same for both the board and in the top executive management. It is also evident that there are some obvious exceptions in this group; some firms have 100 percent female representation in their top executive management. It is important to remember that the number of individuals that constitute the top executive management in these firms differ. Some firms, for example several firms in the shipping industry, only have one person in their top executive management. If this is a female the numbers become skewed and represent outliers rather than a general trend.

5.2.2 Empirical Results

As we want to test whether or not the female representation in the top executive management group is affected by how many women that were present on the board before the gender quota reform took full effect, we find it appropriate to illustrate the mean female board percentages (2004) for the two groups, along with the mean female top executive management percentages (2010).

	"Low" group	"High" group
Mean female percentage, Board 2004	3.08	26.53
Mean female percentage, Top Management 2010	6.34	22.77

Table 9: Mean female percentage of Board Directors in 2004 and Top Management Executives in 2010, for "low" and "high" group

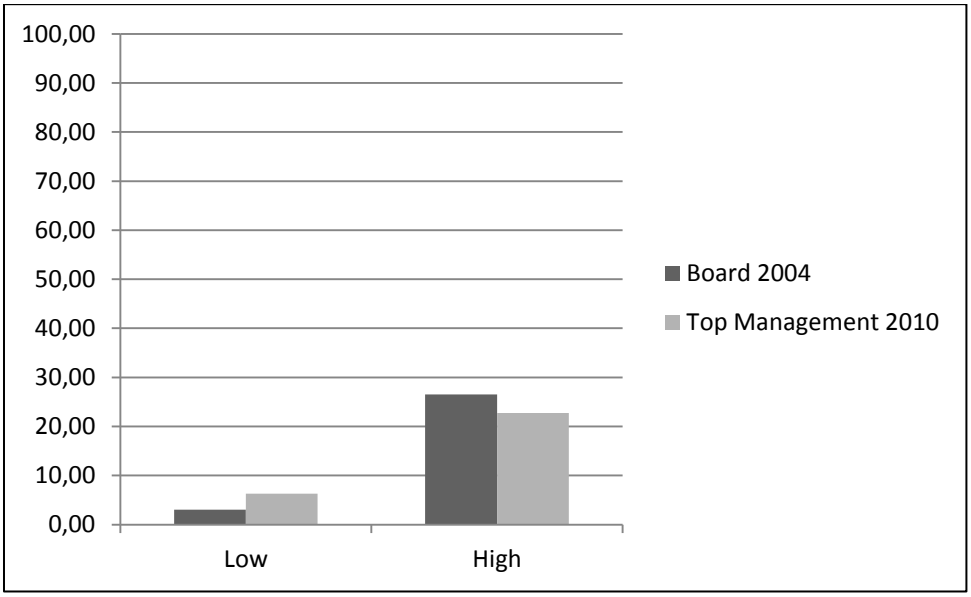

Figure 17: "Low" group versus "high" group, percentage of female Board Directors in 2004 and Top Management Executives in 2010

A graphical presentation of these numbers (Figure 17) shows that there in fact are differences between the two groups in our sample. There is a lower female representation in the top executive management group in the companies that had less women present on the board in 2004.

Because the percentages in the "low" group are so low, one could expect the numbers from 2010 to be higher than the numbers from 2004 as a result of the general development in the society. Women are continuously increasing in numbers in the business world, and as they gain experience a natural result would be that more women progress to positions of power with time. However, in the "low" group there is a general lack of women. Even though there is a higher percentage of women in the top executive management compared to on the board, more than nine out of ten top executive managers in this group are still men.

If we look at the "high" group, the female percentage of top executive managers is slightly lower than the female percentage of the board. However, the "high" group has a 16.43 percentage point higher mean share of women in the top executive management group, compared to the "low" group. One would not expect the two percentages in the "high" group to follow the same pattern as they do in the "low" group, where the percentage for the top executive management group is higher than that of the board. In the "high" group the female board percentage has already reached a substantial level, and thus it would not be natural to expect the female percentage in the top executive management group to increase past this level in such a short time.

The companies in the "high" group were, on average, not too far away from fulfilling the requirements of the quota in 2004. This could mean that the idea of having female executives was not that unfamiliar for these companies, as they were accustomed to having women in influential positions from an earlier stage. We cannot with certainty say that it was easier for the firms with a high female board representation to fulfill the law, as this is very individual from company to company. For example, if a board with eight males and zero females had to exchange three of the male members with new female members, this could be seen as a dramatic change. In reality it might be as demanding to find the last female to fulfill the quota on a board where women already are present. Still, on average, one would think that the transition to fulfill the quota might not have been too dramatic for the companies in the "high" group, and hence the spillover effect might have come as a natural development rather than a hasty leap.

In order to examine these patterns more closely, we have conducted several regressions. In Table 8 we showed the results of the regression of the female share of top management executives in 2010 on the female share of board directors in 2004 (1).

As mentioned in the methodology chapter we created a dummy variable called "group_low2004". This variable has the value 1 if it represents a company in the "low" group, and the value 0 if it represents a company in the "high" group. We continue by conducting a regression of the female share of top management executives in 2010 on this variable (2). We would also like to control for some other factors. These include "boardsize" which is a measure of the number of fixed board members in each of the 88 firms in 2004, as well as "nrofemployees" which represents the total number of employees in the different firms in 2010. We have also included "sectorcode", which is a dummy variable with the value of 0 or 1 depending on whether or not a given firm belongs in a specific sector. The last regression is based on the female share of top management executives in 2010 on the female share of board directors in 2004, "group_low2004", board size, number of employees, and sector codes (3). The results are reported in Table 10 and 11.

Dependent variable: Female share of top executives in 2010	
	(2)
Group_low2004	(-)16.4264***
	4,3118
_cons	22.7664***
	3.0141
Observations	88
R-squared	0.1444
Adj. R-Squared	0.1344
*** p < 0.01, ** p < 0.05	
Notes: Standard errors reported in italics. (2) reg top2010 group_low2004	
top 2010: female share of top executives in 2010	
group_low2004: dummy variable, =1 if firm is in "low" group and =0 if firm is in "high" group	

Table 10: Main results 2: top2010 group_low2004

In Table 10 we can see that the constant is 22.77 percent. Interpreting the dummy variable leaves us with a fraction of women in the top executive management group in 2010 of: 22.77 – (16.43*group_low2004). If a given firm is in the "low" group in 2004, the fraction of women in the top executive management group should decrease with 16.43 percent compared to if the firm was in the "high" group in 2004. If a given firm is in the "high" group in 2004,

the variable group_low2004 would be zero, and the regression equation would result in only the constant; 22.77 percent. In other words, there is a difference between the two groups.

To see if this difference is significant we can analyze the p-values. Both the coefficients have a p-value of zero, indicating that the values are statistically significant. The commonly used value for the level of significance is 5 percent. Thus, we are willing to take a five percent chance of committing a type I error. A type I error occurs when the null hypothesis is true, but the sample evidence causes one to mistakenly reject it. The decision rule is to reject the null hypothesis if the p-value is less than the level of significance. In this case, the p-values are zero, which is clearly smaller than 0.05, thus we can reject the null hypothesis and conclude that the two variables are related. A p-value of zero is saying that there is absolutely no chance one could get these sample results if the two variables are not related. Because both the coefficients have a value of zero, they are significant regardless of what level of significance we use.

The coefficient of determination (R-squared) is 0.1444. The closer this value is to 1, the stronger the correlation between the two variables is. Because we are working with micro data there are many factors that can influence the relationship between the variables, and as a result 0.1444 is a relatively high measure. The adjusted coefficient of determination is 0.1344.

Dependent variable: Female share of top executives in 2010			
	(1)	**(2)**	**(3)**
Female share of board directors in 2004	0.7776***		
	0.1463		
Group_low2004		(-)17.5776***	(-)16.4468**
		4.1919	*4.7502*
Board size 2004			0.4258
			1.3628
Nr of employees 2010			(-)0.0004
			0.0004
I_sec2			(-)14.2669
			10.3118
I_sec3			12.0225
			10.2049
I_sec4			(-)10.6627
			7.1875
I_sec5			(-)13.0713
			11.8501
I_sec6			(-)4.1987
			7.6344
I_sec7			(-)23.6113
			15.933
I_sec8			(-)12.7170
			10.4223
I_sec9			(-)8.216
			10.4708
I_sec10			(-)4.3944
			21.4341
I_sec11			(-)13.5652
			21.3798
_cons	3.0184***	22.7664***	27.03139
	2.9921	*2.9302*	*11.0212*
Observations	88	88	88
R-squared	0.2472	0.1444	0.2527
Adj. R-Squared	0.2384	0.1344	0.1214
*** p < 0.01, ** p < 0.05			

Notes: Standard errors reported in italics. (1) reg top2010 board04 (2) reg top2010 group_low2004 (3) reg top2010 group_low2004 boardsize nrofemployees I_sec2-11
top2010: female share of top executives in 2010
group_low2004: dummy variable, =1 if firm is in "low" group, and =0 if
boardsize: number of fixed board members in 2004
nrofemployees: number of fixed employees in 2010
I_sec: dummy variable, =1 if a firm is in a given sector, and =0 if firm is not
See appendix for list of sectors

Table 11: Main results 3: Comparison of the regressions (1), (2), and (3)

In Table 11, column (3), neither "boardsize" nor "nrofemployees" are significant, which means that they do not have an effect on the relationship between the percentage of female board members in 2004 and the percentage of female top executive managers in the same firms in 2010.

If we look at the variable "sectorcode" there is some variation between the values, but none of them are significantly different from zero. Some of the sectors might have had an influence on the relationship if we were to look at them isolated, but combining all the sectors in a regression one can clearly see that they have no effect on our main result. We can read from the table that the coefficient of determination has increased compared to the values in regression (2). R-squared is now at 25.27.

The reason we wanted to include sector codes was to see if there was a noticeable difference between traditionally male and female-dominated sectors when it comes to the representation of women in both the boards and top management. Matsa & Miller (2011) point out that some industries may attract a greater supply of female talent because of their corporate culture or specific customer group. Furthermore, they argue that women may have specific skills that are more valuable in some environments than others (Matsa & Miller, 2011). We may expect that female dominated sectors might have a higher percentage of female board directors and female top executives.

Figure 18 shows the amount of women and men working in the different sectors in Norway. These sectors are not completely the same as we have used in our regression. For example, in Figure 18, health and social services is the sector with the highest amount of women employed. This sector is not included in our sample. This might be due to the fact that the majority of these types of firms are not listed as Public Limited Companies. However, the distributions shown in Figure 18 give us an indication of the gender distribution. We can see

that the construction industry (stippled circle) and the primary industry (black circle) have a very low share of female employees.

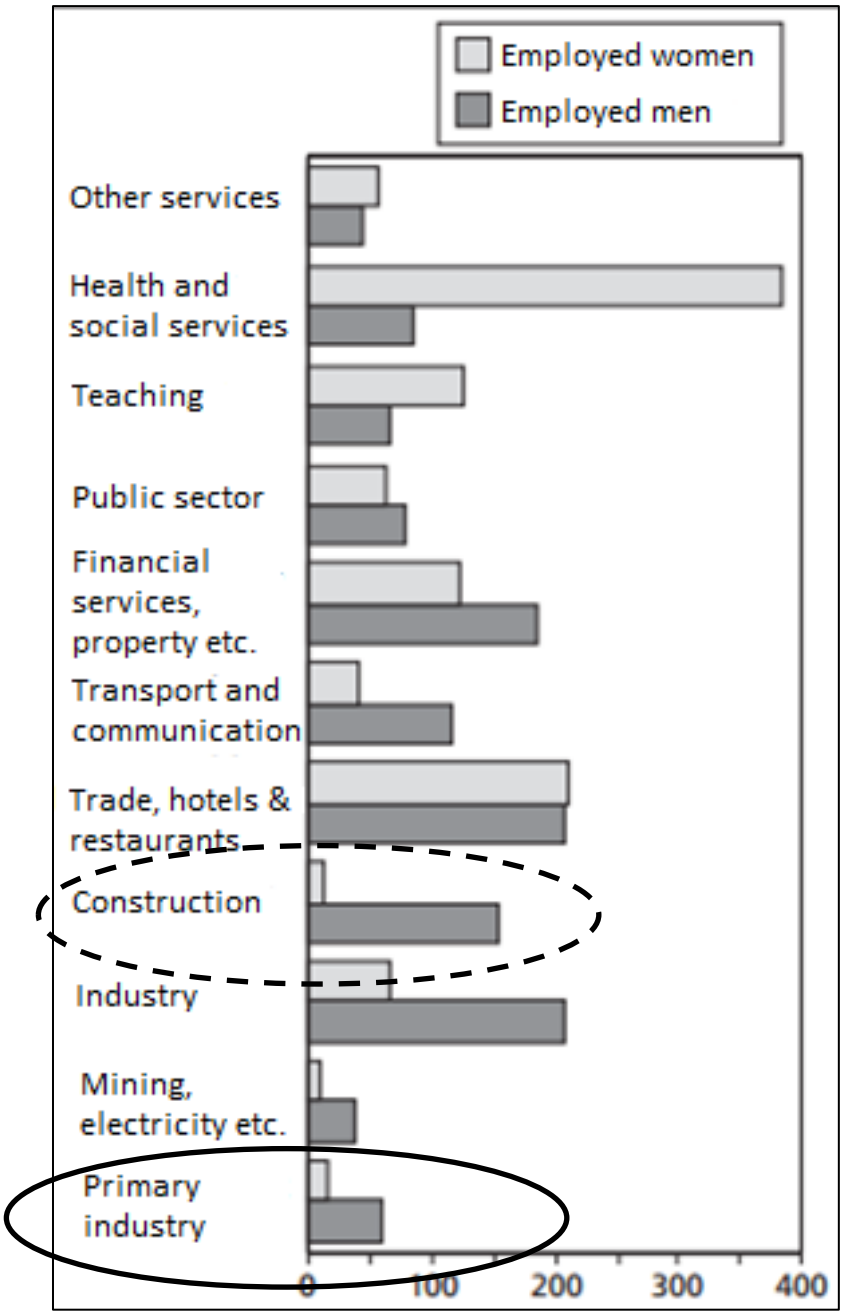

Figure 18: Employed in the different sectors; in Norway, by gender
(*Svalund, 2009: http://www.fafo.no/pub/rapp/20102/20102.pdf*)

In Figure 19, which is based on our sample of 88 firms, we can see that the distribution from Figure 18 might not be very comparable.

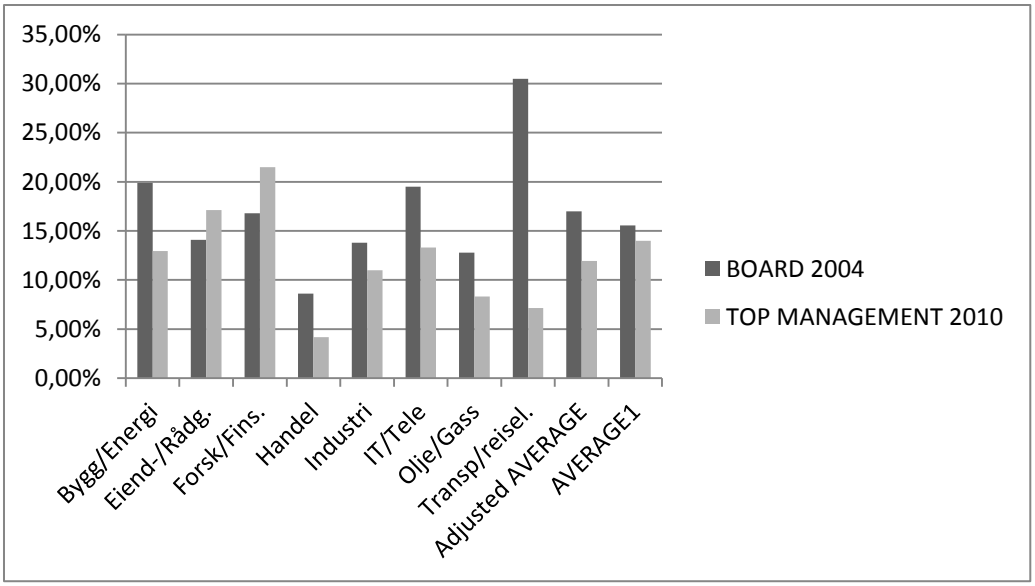

Figure 19: Female percentage of board directors in 2004 and female percentage of top executive managers in 2010, by sector[7]

If we disregard the sector of "culture" (this sector only includes one football club which we can assume is not very representative for the companies in our sample, considering that their business structure differs greatly from that of most Public Limited Companies), trade is the sector with the lowest female board representation. Transportation/tourism is the one with the highest female board representation. The other sectors are approximately evenly distributed with a female board representation around fifteen percent.

When it comes to the top executive management, trade is again the sector with the lowest female representation along with transportation/tourism and oil/gas. On the other end of the scale, the primary industry and shipping are the two sectors with the highest female representation. The percentage for the shipping sector is slightly skewed. Most of the firms in this category of our sample only have one person sitting in their top executive management. In addition, several firms in this sector are family businesses where a woman is the only registered employee in the company.

We remember from Figure 18 that the construction industry and the primary industry are two of the sectors with the highest female board and top management representation overall in Norway. In other words, there are no clear connections between a sector being female-dominated and the sector having high female board and top management representation in our sample.

[7] The number of firms are not evenly distributed among the different sectors

5.2.3 Discussion of the Results

Our results show that there is a significant connection between the fraction of women on the board in 2004, and the fraction of women in the top executive management groups of the same firms in 2010. In other words, given time, (in our case, six years) the percentage of women on the board will have an effect on the percentage of women in the top executive management groups of the same firms. Taking a deeper look at the relationship, one can also see that firms with a low share of women on the board have a lower share of women in their top executive management groups compared to those firms with a higher share of women on the board.

This shows that the gender quota reform could create substantial spillover effects, increasing the number of women at the top of the corporate ladder. All the Public Limited Companies in Norway now have approximately 40 percent women on the board, as a direct effect of the gender quota reform being passed. This means that all these companies would now be categorized as having a high percentage of female board members. Our results show that a high percentage of women board directors leads to a high percentage of female top executive managers. Because the firms that were in the "low" group now have a higher share of women in the board room, one could assume that, given time, this could lead to an increase in the share of women in the top executive management group of these firms. The gender quota reform will, in other words, contribute to an increase in the total fraction of women in the top executive management groups. It is also important to remember other indirect effects of the reform, which ideally could lead to a change in the beliefs and attitudes regarding women in business.

5.2.3.1 Validity

An important aspect to any research is whether or not one is able to draw credible conclusions based on the findings in question. There are two main measures of credibility; validity and reliability. Validity refers to what extent one is able to generalize the results of the chosen sample to a whole population (Saunders et al., 2009). Reliability refers to what extent our research will yield consistent findings if used in other circumstances and with different samples (Saunders et al., 2009).

In order to ensure that the data we collect are valid and can be used to test the proposed relationship between our subgroups, we have to make sure that the chosen variables have been

measured correctly. In our case, this entails assessing the quality of the variables we have decided to include in our analysis. It also involves a discussion around our final sample.

We received most of our data set from SNF, and thus we have no way of controlling whether there has been made any mistakes when collecting and presenting these data. However, we consider SNF to be a reliable source as they are a well-established and influential research institution in Norway. We hand collected the data on female top management representation ourselves, and thus we cannot guarantee that we did not make any errors during this process. Nevertheless, because of the limited size of the available sample, we were very meticulous in our data collection to ensure that our data held the necessary quality.

Our method of conducting a sample involves a non-random approach. However, we have compared the mean and standard deviation of our sample of 88 firms and all the 182 ASA's that existed from 2004 to 2010. The results show that these variables are fairly similar, which indicates that we have a representative sample.

5.3 Further Findings

5.3.1 Firms' Adjustment of Fraction of Women to the Quota

We also wanted to test in what way the affected firms had met the requirements of the gender quota reform. This could be a proxy for how the firms behave regarding gender equality. We would expect some firms to reduce the number of board directors to avoid increasing the number of women. Some firms might simply increase the number of women on the board to avoid letting competent men that already have a place on the board, go. Furthermore, some firms might increase both the size of their board and the number of women, while other firms might choose to reduce the number of board members as well as increasing the number of female directors. One can assume that the firms that kept their board size constant, view men and women as equally "valuable". The numbers presented in Table 12 are taken from the second Excel sheet we received from our supervisor. The numbers of interest are the total number of board members and number of female board members in the different firms in the different years.

		Number of firms	Total number of firms	Percentage
1	Did not fulfill the quota by 2009	17	88	19.32%
2	Fulfilled the requirements all the years (2004-2009)	8	88	9.09%
3	Reduced the size of the board	1	88	1.14%
4	Increased the number of women on the board	22	88	25.00%
5	Increased both the number of women on the board and the total size of the board	25	88	28.41%
6	Reduced the size of the board and increased the number of women on the board	15	88	17.05%
	Total number of firms	88		

Table 12: In what way have the affected firms met the requirements of the gender quota reform?

As we can see from Table 12, some firms fulfilled the quota already before they were required to (2). Only 1 firm decided to reduce the number of board directors to meet the requirements (3). This might tell us that most of the firms were positive to the idea of introducing more women to the board room. 37 firms increased the number of female directors by replacing some of the men to meet the requirements (4, 6). The 25 remaining firms (5) also increased the number of female board directors, in combination with increasing the total size of the board. In other words; in some way or another 62 out of 88 firms, more than 70 percent of the total sample, decided to increase the number of women on their boards. This could indicate that most firms are "female friendly", or at least not opposed to the thought of introducing more women to the board room.

However, we are not completely sure of the philosophy behind the choices of the firms that decided to reduce the total number of board directors and increase the number of female directors. This could either mean that they did not approve of the idea of introducing more women than necessary to their boards, and decided to remove some of the men that were already on the board, to avoid more women. On the other hand, it could also mean that they wanted to avoid the cost of sustaining a large board, so instead of introducing more women without removing men, they decided to introduce women at the expense of some of the men.

Finally, we decided to divide the firms into our two groups, "low" and "high", to see if there were any differences between the groups when it comes to how the firms have adjusted the fraction of women to fulfill the quota. If the firms in the "low" group have reduced the size of the board to avoid including more women in their boards, this could indicate that these firms were not very female friendly to start with. If this is the case, introducing more women to these boards might not alter their attitude.

		"Low" group	"High" group	Total
1	Did not fulfill the quota by 2009	8	9	17
2	Fulfilled the requirements all the years (2004-2009)	0	8	8
3	Reduced the size of the board	1	0	1
4	Increased the number of women on the board	10	12	22
5	Increased both the number of women on the board and the total size of the board	17	8	25
6	Reduced the size of the board and increased the number of women on the board	7	8	15
	Total number of firms	43	45	88

Table 13: In what way have the affected firms met the requirements of the gender quota reform? Displayed by "low" and "high" group

From Table 13 it is noteworthy that all the 8 firms that had fulfilled the requirements of the quota before the law was passed belong to the "high" group. However, there are no differences between the two groups when it comes to which firms that had not yet fulfilled the quota by the end of 2009. The other noticeable difference is within category 5, where the majority of the firms that increased both the number of women on the board and the total size of the board belong to the "low" group. This could indicate that these firms felt that the male board directors were competent, and did not want to remove any of them in order to fulfill the quota. Hence the only option would be to increase both the number of women and the size of the board.

Still, these outcomes do not give any clear answers as to whether the firms in the "high" group are more female-friendly than the firms in the "low" group. 79 percent of the firms in the "low" group have in one way or another increased the amount of women on the board. The corresponding number for the "high" group is 62 percent.

5.3.2 Firms That Had Not Fulfilled the Quota by the End of 2008

	2008					2009			
Firm #	Board Members	Female Board Members	Percent	Fulfilled the Quota	Firm #	Board Members	Female Board Members	Percent	Fulfilled the Quota
1	11	3	27.27%	no	1	11	3	27.27%	no
2	10	3	30.00%	no	2	9	3	33.33%	no
3	8	3	37.50%	yes	3	7	2	28.57%	no
4	10	3	30.00%	no	4	10	3	30.00%	no
5	7	2	28.57%	no	5	7	2	28.57%	no
6	7	2	28.57%	no	6	7	2	28.57%	no
7	9	3	33.33%	no	7	8	2	25.00%	no
8	9	3	33.33%	no	8	8	2	25.00%	no
9	8	2	25.00%	no	9	8	2	25.00%	no
10	7	2	28.57%	no	10	7	2	28.57%	no
11	7	2	28.57%	no	11	7	2	28.57%	no
12	6	2	33.33%	no	12	6	2	33.33%	no
13	8	2	25.00%	no	13	8	2	25.00%	no
14	6	3	50.00%	yes	14	8	2	25.00%	no
15	11	4	36.36%	no	15	11	4	36.36%	no
16	7	2	28.57%	no	16	7	2	28.57%	no
17	10	3	30.00%	no	17	10	3	30.00%	no

Table 14: List of firms that had not fulfilled the quota by the end of 2008 and 2009

As shown in Table 12 and 13 there were some firms that still had not fulfilled the requirements of the gender quota reform by the end of 2009. According to the law, the firms were supposed to fulfill the quota by January 1, 2008, and if they failed to do so, they could risk being dissolved. We can see from Table 14 that fifteen firms had not fulfilled the quota by the end of 2008. This makes up 17.05 percent of the 88 firms in our sample. By the end of 2009, two additional firms did not fulfill the requirements of the quota; increasing the percentage to 19.32 percent of our sample of 88 firms. According to Table 14, it is mainly firms with larger boards that have failed to fulfill the requirements of the quota. The Public Limited Liability Companies Act opens for some exceptions to this dissolution, for example if the firms are of a certain importance to the field they are operating within. One could speculate that firms with larger boards tend to be larger organizations, and thus being of higher importance to their field.

6 Discussion

Our results show that firms with a low percentage of female board members in 2004 have a lower percentage of female top executive managers in 2010, compared to the firms with a high percentage of female board members in 2004. In this chapter we will propose some

explanations of the results we received, as well as link these to our initial theory, adding new descriptions and details where we find it necessary. In addition, we will emphasize some points and differing views regarding gender quotas and gender equality both in general and connected to firm performance.

According to Matsa & Miller (2011), board membership affects female professional advancement. They find that there are differences between the genders when it comes to both preferences and how they process information. Matsa & Miller (2011) argue that when it comes to preferences, one or both genders favor the gender they belong to and discriminate against the other. When it comes to processing information, they argue that individuals are better at interpreting "noisy" information from other individuals of the same sex as themselves (Matsa & Miller, 2011). In turn, these arguments highlight the importance of demand side and institutional barriers.

In addition to these direct effects, there might also be indirect effects of increased female board representation. These effects could include changes in the company's corporate culture that make the experience of both obtaining and performing in top executive positions more appealing for women (Matsa & Miller, 2011). One of the main implications from the study of Matsa & Miller (2011) is that public policies aimed at increasing female board representation, such as the Norwegian gender quota reform, may lead to general spillovers in several stages of management, including the highest positions (Matsa & Miller, 2011). Moreover, there might be a feedback cycle in which the presence of more female managers increases the pool of qualified, potential female board members. Thus, we might experience greater female board participation and in turn, further increasing the number of female executives (Matsa & Miller, 2011). The full effect of promoting more women to top executive positions will be further amplified if those women serve as role models or mentors for other aspiring women at lower ranks in their organization and in their industries (Matsa & Miller, 2011).

Even though gender quota reforms have been successfully established in several countries by now, there has been a discussion around whether or not a compulsory government measure is the way to go to achieve more gender equality. Ideally one would like a natural development, but if such measures could speed up the process there might not be a downside to it. However, it is important that these measures are constructed in a way that encourages changes in the underlying beliefs and attitudes, rather than just a cosmetic adjustment. Even though the Norwegian gender quota reform was able to increase the percentage of female board directors,

it is crucial to follow up this initiative to make sure that the attitudes and beliefs permeate the society. However, it is very difficult to change the beliefs of someone that does not know that a problem exists. McKinsey found in their "Women Matter 2012" study that women and men have differing views on gender diversity. The study includes 235 large European companies and more than 1500 respondents. Only 30 percent of the female respondents think that the evaluation system in their firm treats men and women equally. The corresponding number for men is 65 percent (McKinsey & Company, 2012). In the companies where this difference is most prominent, the increasing share of women on the corporate boards may help highlight this issue.

In chapter 3 we presented several possible explanations as to why there should be spillover effects from the board room to the top executive management group of firms. One of the possible explanations concerns the value of networks. If we view our results in light of this, one could argue that imposing a quota is a positive measure in order to increase the share of female top executives. Introducing women to a board would allow them to gain entry into the male-dominated business network. When looking to hire new candidates for the top executive management group, the new female board members would, through their networks, also give the board access to additional female competence.

Quotas also appear to be a positive measure if we consider the effects of female role models. More women on the board increase the possibility of more women acting as positive role models to other aspiring women. In addition, the new female board members could also act as mentors. In many cases they would hold valuable experience in being a female minority in a male-dominated business. More female board directors would increase the pool of possible female mentors. Thus, if it is desirable to increase the amount of competent female mentors, as well as providing more female talent with the opportunity of being mentored, imposing a quota could be good way to achieve this.

If a firm is in the "low" group because it has a negative view on women's aptitude for business, imposing a quota could have an unfortunate effect. In these cases, women's appearance may simply increase the hostility towards women in business. Unless the women that enter the board are extremely talented and able to convey this, the prejudices against women may be confirmed, creating a double negative effect. However, the outcomes presented in Table 13, show that only one firm reduced the size of the board in order to fulfill the requirements of the gender quota reform. The other firms decided, in one way or another,

to increase the number of women on their boards. This could indicate that firms in our sample are not necessarily negative towards female board directors. The absence of women may arise from other factors such as lack of competent women within specific male-dominated industries.

Some think the effect of a quota could backlash. Other women will know that the women on the boards are there because of a quota and not necessarily because of their talent. As a negative spillover effect, these "token" women could act as undesirable role models. On the other hand, some women argue that without their positions as "token" women, they would never have climbed as far as they have on the corporate ladder.

In the UK women make up approximately half of the work force. However, they are strongly underrepresented in senior management, and in particular in boardrooms. In 2011, the British government recommended that companies in the FTSE UK Index series should aim for a minimum of 25 percent female board member representation by 2015. The Confederation of British Industry (CBI) has warned that listed companies must convince the European Union that they are doing what they can to increase the number of women in their boards, and if not they will face compulsory Government measures, such as quotas (White Water Group, 2012).

A study on the matter was performed by the British leadership consultancy White Water Group. The purpose of the study was to survey opinions, and leaders of 30 corporate women's networks that represent more than 10, 000 female workers at some of the top firms in the UK contributed. The report reveals that two thirds of the women had seen no change in the opportunities for their gender in their companies. 80 percent of the respondents think it will take up to 20 years to reach 30 percent female executives, while the remaining respondents think it will take even longer. Two thirds believe that quotas are the only solution to achieve the target of 25 percent female board representation within 2015 (White Water Group, 2012).

This thesis has indicated a positive correlation between the percentage of female board representation and the percentage of female top management representation. Firms with higher female board representation in 2004 have a significantly higher female top executive management representation in 2010, compared to those firms with low female board representation in 2004. However, we are aware that the main challenge regarding this transition will be time. Even though we can detect a positive relationship between female board directors and female top executives now, we expect these effects to increase with time. As shown in our empirical results, an increase in the fraction of women on the board will

eventually cause a spillover effect to top management. An important question that still remains unanswered is how long we need to wait to see the full effect of this relationship. Many of the people in the top executive management today have been holding their positions for several years. Maybe we have to wait for the next "generation" of top executive managers to see significant changes regarding gender distribution.

Matsa & Miller (2011) point out that an increased share of female board directors may increase the *desire* to hire female executives. However, the actual numbers might not change immediately. Even though a firm sees the value of a diversified top management group, the positions might already be filled with qualified candidates. In this case the firm might have to create a new position to increase the female share, but such reorganizations can be both costly and time consuming.

Furthermore, female leaders need time to establish themselves at the top executive level. The stereotypes and perceptions against female leaders are often rooted so deeply amongst men and breaking these down will take both time and effort. Men need to experience personally that women can be good leaders, and for this to happen, the women first need to achieve top management positions, as well as be given time to excel in them.

The aspect of time is also evident in a study Schein (2001) has conducted in five large economies (China, Japan, Germany, UK and the US). Schein (2001) wanted to see whether female and male management students have differing views on what characteristics a leader should possess. The respondents were asked to rate 92 descriptive terms (the 92-item Schein Descriptive Index) commonly used to describe people in general, according to how characteristic the terms were of "women", "men", and "successful managers". The study reveals that in all the countries the men see strong similarities between typical male character traits and the traits they think that a successful leader should possess, while there are significant differences in the female perceptions (Schein, 2011). Examples of male (and successful leader) character traits are competitiveness, curiosity, independence, and authority. On the other hand, women are perceived to be sympathetic, neat, helpful, and sentimental (Kasi & Dugger, 2000).

Furthermore, the study shows that in Japan, where one is not used to seeing women in positions of power, the female business students are not able to see similarities between women and leaders. The lack of female role models may slow the gender equality process down because the idea of gaining a position of power is improbable for the average woman.

These aspects can be linked to the time parameter in that the idea of a leader being male is so deeply established within both the female and male gender identity. In other words, we need to not only show women that they are capable to climb the corporate ladder, we also need to allow some time to change the underlying attitudes and perceptions that men have against female leaders. This study shows us that there is a possibility that these male perceptions of women's value as leaders may continue to hinder women's progress into the top executive management level for quite some time (Schein, 2011).

There are a lot of aspects that need to be taken into consideration when discussing gender quotas. At first glance, the desire for gender equality appears to be a good thing, but the subject is complex and requires deeper analysis. In some special cases, intervening with the gender composition of a well-functioning board of directors could possibly diminish the value creation of the firm.

Research shows that there are several arguments weighing against diversity on boards. The most prominent arguments are rooted in heterogeneous boards producing more opinions and critical questions, which in turn may be time consuming and ineffective. This is especially relevant for firms operating in dynamic and highly competitive environments, where the ability to quickly adapt to market changes is crucial (Smith et al., 2005). In addition, some argue that "forcing" more women to enter the boards through gender quotas might have a negative effect on shareholder value, if the boards were effectively shaped without governance interference. The boards are often chosen to maximize shareholder value, and as a consequence, one should think that restricting the compositions of the boards should lead to a decrease in value (Indseth, 2010).

This view is supported my Dittmar et al (2010). They have studied Tobins Q for 130 Norwegian Public Limited Companies from 2001 to 2007, a parameter which is based on the difference between book value and market value of a company. The study showed that as the proportion of women increased by 10 percent on the boards, Tobins Q fell by 18 percent. Even though the researchers argue that this decrease in value is not due to the women in themselves, but rather to the fact that the newly recruited women are young and lack board experience, the results still show that restrictions on board composition does have a negative effect on firm value (Indseth, 2010).

However, recent debates have also centered towards what positive effects female directors and managers could have on both shareholder value and firm performance. Smith et al. (2005)

conducted a panel study that examined the relationship between management diversity and firm performance for the 2500 largest firms in Denmark from 1992-2001. They have defined management diversity as the proportion of women among the highest ranking CEO's in firms and on the board of directors. Regarding women in top executive positions, the positive effect is only significant for gross value added. If vice directors are included, the coefficient is significant for three out of four performance matters (de Luis-Carnicer et al., 2008). Smith et al (2005) also argue that diverse boards (directors or executives) are able to make decisions based on broader backgrounds, compared to homogenous boards. Furthermore, diversity may increase creativity and innovation, as well as creating a positive image of the firm towards for example consumers. This in turn may create positive spillover effect on firm performance and shareholder value (Smith et al., 2005).

According to a study of 215 Fortune500 companies by Adler (2001), the companies with a high number of female executives outperformed their industry medians on several measures of profitability, including profits as a percentage of revenues. Erhardt et al. (2003) studied 127 large U.S. companies, and found a positive significant relationship between the percentage of women on boards of directors on both return on assets and return on investment. Catalyst (2004) examined 353 Fortune companies between 1996 and 2000. After controlling for industry and company differences, they found that the group of companies with the highest percentage of women in their top management experienced better financial performance compared to the group of companies with the lowest percentage of women (de Luis-Carnicer et al., 2008).

As we can understand from these ambiguous results, there is no clear conclusion to the economic effects of more women on the board and in the top executive management group, and whether or not the increase enhances shareholder value or firm performance. The same reasoning applies to gender quotas – it is very difficult to reach a clear conclusion and to determine whether or not it is a solely positive measure. If we just look at the desire to increase the share of female top executives, this master thesis has found that having a high share of female board directors leads to a higher share of female top executives. In other words, in this case one should think that a gender quota is a helpful measure.

6.1 Suggestions for Further Research

During our work with this master thesis we have come across several very interesting aspects related to our research question, that due to restricted time and the limitation of our thesis, are not discussed. This chapter will shortly present some possible subjects for further research.

Even though there is broad agreement that more women in top management is a desirable outcome, few researchers have yet analyzed the full effect of this change. It would be very interesting to know more about which changes that actually would occur, as well as the effects of these changes, internal and external, positive and negative.

There has also been a discussion centering on whether quotas is the right way to go to achieve more gender equality. Is imposing a gender quota in areas of business where women are a "natural" minority really the way to go, or should one let nature run its course? If the women are talented enough, one would think that they will find their way to the top eventually. Some women have clearly expressed that they do not want to be a part of a board because of a quota; they want to be chosen because of their qualifications and talent. In this sense, a quota could work against its purpose, opposing the opinions of both men and women.

Furthermore, some companies have started to publish relatively detailed information about their female managers. One of the firms included in our study recently hired a new female Chief Executive Officer. The firm posted a press release on their home page offering detailed information about her age, educational background, previous employment etc. It would be very interesting to conduct a new study similar to the one we have done in this thesis, but controlling for these additional personal factors. Also, it would be interesting to create a "profile" of the typical female top executive to see if there are any personal traits and educational backgrounds that recur.

Another point of interest is that the Norwegian workforce is one of the most gender segregated in the world, with women and men consecutively choosing different professions in different sectors. In the health sector, a large majority of the workers are women. It could be interesting to test some of our hypothesis the other way around; what role do men play in these female dominated professions? Are they too being discriminated or do they simply wish to work elsewhere?

Finally, we would like to include the role of the media. We have seen repeated examples of the media treating male and female professionals (leaders, politicians…) differently. Female

leaders are often asked about their hairstyle and choice of wardrobe, while the men are asked about their opinions. One would think that this does not help in removing the gap between the genders. Could the media be an important tool in creating more gender equality? One way to achieve a better balance could be to create a more gender-neutral society. This could be done through acts such as avoiding the typical gender stereotypes already from childhood, for example through creating gender-neutral children's books, advertisements etc.

7 Conclusion

The purpose of this thesis has been to test whether there is a relationship between the percentage of female board directors and the percentage of female top executive managers in the same firms. The question is important today because we are now starting to see the full effects of the gender quota reform that required all Norwegian Public Limited Companies to have at least 40 percent women on their board of directors by January 1, 2008.
Even though the attitude towards the role of women in society has changed dramatically during the last decades, women are still perceived to be less suited for managerial positions than their male counterparts. Our results show that the percentage of female board directors has a significant effect on the percentage of female top executive managers. Firms with more women on the board in 2004, have more women in their top executive management groups in 2010, compared to the firms with few women on the board in 2004.

As the business world now can see an increase in the amount of women holding top executive positions, there will also be more women that can act as role models and mentors to other aspiring women. This increase of women could make it more difficult to exclude women from networks which in turn could lead to a breach in the traditional male dominated hierarchies. These aspects, combined with the attitudes towards female managers becoming more positive, could potentially cause a positive spiral effect – in turn creating a more level playing field for men and women in the business world. However, as changing the corporate culture takes time, we expect these initial effects to become stronger in the future.

8 Attachments

8.1 List of Companies in the Analysis

1	ABG Sundal Collier Holding ASA	45	Kongsberg Automotive Holding ASA
2	Acta Holding ASA	46	Kverneland ASA
3	AF Gruppen ASA	47	Lerøy Seafood Group ASA
4	Aker ASA	48	Marine Harvest ASA
5	Aker Solutions ASA	49	Moelven Industrier ASA
6	Aktiv Kapital ASA	50	Nordic Semiconductor ASA
7	Akva Group ASA	51	Nordlandsbanken ASA
8	Algeta ASA	52	Norgesgruppen ASA
9	Arendals Fossekompani ASA	53	Norse Energy Corp. ASA
10	Asker og Bærums Budstikke ASA	54	Norsk Hydro ASA
11	Atea ASA	55	Norske Skogindustrier ASA
12	Binor Pharma ASA	56	Norwegian Air Shuttle ASA
13	Birdstep Technology ASA	57	Norwegian Car Carriers ASA
14	Blom ASA	58	Nos Clearing ASA
15	BN Bank ASA	59	Olav Thon Eiendomsselskap ASA
16	Bonheur ASA	60	Opera Software ASA
17	Borgestad ASA	61	Orkla ASA
18	Byggma ASA	62	Oslo Børs VPS Holding ASA
19	Caranegie ASA	63	Petroleum Geo-Service ASA
20	Cermaq ASA	64	Photocure ASA
21	Diagentic ASA	65	Protector Forsikring ASA
22	DNB ASA	66	PSI Group ASA
23	DNB Bank ASA	67	Q-Free ASA
24	DNB Livsforsikring	68	Rieber & Søn ASA
25	DNO International ASA	69	Rocksource ASA
26	Domstein ASA	70	Scana Industrier ASA
27	EDB Ergogroup ASA	71	Schibsted ASA
28	Eitzen Maritime Services ASA	72	Sevan Marine ASA
29	Ekornes ASA	73	Sinoceanic Shipping ASA
30	Eksportfinans ASA	74	Skiens Aktiemølle ASA
31	Farstad Shipping ASA	75	Storebrand ASA
32	Fondsfinans ASA	76	Teco Maritime ASA
33	Fondsfinans Kapitalforvaltning ASA	77	Telenor ASA
34	Fred Olsen Energy ASA	78	Tide ASA
35	Ganger Rolf ASA	79	Tomra Systems ASA
36	Glamox ASA	80	Torghatten ASA
37	Goodtech ASA	81	TS Nopec Geophysical Company ASA
38	Guard Systems ASA	82	TTS Group ASA
39	Hafslund ASA	83	Ulstein Group ASA
40	Hexagon Composites ASA	84	Veidekke ASA
41	Idex ASA	85	Verdibanken ASA
42	Imarex ASA	86	Viking Fotball ASA
43	Itera ASA	87	Voss Veksel- og Landmandsbank ASA
44	Kolibri Kapital ASA	88	Yara International ASA

9. References

9.1 Articles, Books, and Reports

Adams, R. B., & Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics*.

Ahern, K. R., & Dittmar, A. K. (2011). *The changing of the boards: the impact on firm valuation of mandated female board representation.*

Basow, S. A. (2011). Evaluation of female leaders: Stereotypes, prejudice, and discrimination in the workplace. In M. A. Paludi, & B. E. Coates, *Women As Transformational Leaders: From Grassroots to Global Interests.* Santa Barbara: Praeger.

Bilimoria, D. (2006) *The Relationship Between Women Corporate Directors and Women Corporate Officers*. Journal of Managerial Issues. Vol. XVIII No 1.

Blake-Beard, S. (2003). Critical trends and shifts in the mentoring experiences of professional women. *The Linkage Leader*.

Brown, D. A., Brown, D. L., & Anastasopoulos, V. (2002). *Women on boards - Not just the right thing but the "bright" thing.*

de Luis-Carnicer, P., Martinez-Sanchez, A., & Perez-Perez, M. (2008). Gender diversity in management: curvilinear relationships to reconcile findings. *Emerald Insights*.

Elsesser, K. M., & Lever, J. (2011). Does gender bias against female leaders persist? Quantitative and qualitative data from a large-scale survey. *SAGE*.

Erhardt, N., Werbel, J. & Schrader, C. (2003), "*Board of director diversity and firm financial performance*", Corporate Governance: An International Review, Vol. 11 No. 2.

Geyer-Semple, V. (2011). Classroom to Boardroom: The role of gender in leadership style, stereotypes and aptitude for command in public relations. *Public Relations Journal Vol. 5*.

Goldin, C. (2006). The quiet revolution that transformed women's employement, education, and family. *American Economic Review*.

Heidenreich, V. (2010). Rekruttering til ASA-styrer etter innføring av kvoteringsregelen. *Magma*.

Høigaard, R., & Mathisen, P. (2009). Benefits of formal mentoring for female leaders. *International Journal of Evidence Based Coaching and Mentoring*.

Hunt, D. M., & Michael, C. (1983). Mentorship: A Career Training and Development Tool. *The Academy of Management Review*.

Huse, M., & Solberg, A. G. (2004). Gender related boardroom dynamics: How women make and can make contributions on corporate boards. *Gender in Management: An International Journal*.

Joy, L. (2008). *Advancing women leaders: The connection between women board directors and women corporate officers.* Catalyst.

Kasi, B., & Dugger, J. C. (2000, August). Gender Equity in Industrial Technology: The Challenge and Recommendations. *Journal of Industrial Technology*, pp. 5-6.

Kohler, U & Kreuter, F. (2005). *Data Analysis Using Stata.* Second Edition.Stata Press

Linehan, M., & Scullion, H. (2008). The Developement of Female Global Managers: The Role of Mentoring and Networking. *Journal of Business Ethics*.

Matsa, D. A., & Miller, A. R. (2011). Chipping Away at the Glass Ceiling: Gender Spillovers in Cirporate Leadership. *American Economic Review: Papers & Proceedings, Forthcoming*.

McKinsey & Company. (2012). *Women Matter 2012: Making the breakthrough.*

Mjøs, A., & Øksnes, K. (2011). *Arbeidsnotat nr. 10/11: Dokumentasjon og kvalitetssikring av SNFs og NHHs database med regnskaps- og foretaksinformasjon for norske selskaper.*

Murray, P. A., & Syed, J. (2010). Gendered observations and experiences in executive women's work. *Human Resource Management Journal*.

Reeves, M. E. (2010). *Women in business. Theory, case studies, and legal challenges.*

Rudman, L. A., Moss-Racusin, C. A., Phelan, J. E., & Nauts, S. (2011). Status incongruity and backlash effects: Defending the gender hierarchy motivates prejudice against female leaders. *Journal of Experimental Social Psyckology*.

Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students.* Essex: Pearson Education Limited.

Schein, V. E. (2011). A global look at psychological barriers to women's progress in management. *Journal of Social Issues, Vol. 57, No. 4*.

Sealy, R., & Singh, V. (2010). The Importance of Role Models and Demographic Context for Senior Women's Work Identity Development. *International Journal of Management Reviews*.

Singh, V., & Vinnicombe, S. (2004). Why So Few Women Directors in Top UK Boardrooms? Evidence and Theoretical Explanations. *Corporate Governance: An International Review*.

Smith, N., Smith, V., & Verner, M. (2005). Do women in top management affect firm performance? A panel study of 2500 Danish firms. *IZA*.

Storvik, A. E. (2011). *Women on boards - Experience from the Norwegian Quota Reform.*

Warning, R., & Buchanan, R. F. (2008). An exploration of unspoken bias: women who work for women. *Emeraldinsight*.

Wellington, S., & Spence, B. (2001). *Be Your Own Mentor: Strategies from Top Women on the Secrets of Success.* New York: Random House.

Wooldridge, J. (2008). *Introductory Econometrics. A Modern Approach.* 4e International Edition. Cengage Learning Inc.

Yasin, J., & Helms, M. M. (2007). Population, employment, and marital status trends: Predicting the number of women in managerial positions. *Journal of Organizational Culture, Communications and Conflict*.

9.2 Lecture Notes

Kunze, A. (2011). Lecture note, The Norwegian School of Economics: *Occupational segregation.*

Kunze, A. (2011). Lecture note, The Norwegian School of Economics: *Segregation in the firm: Top jobs and ranks.*

9.3 Master Theses

Aavatsmark, S. V., & Rønningen, S. (2011). *Kvinner i styrerommet: Aksjepriseffekten av innføringen av regler om kjønnskvotering i styreme i norske allmennaksjeselskaper.*

9.4 Websites

Adler, R. (2001). *Women in the executive suite correlate to high profits*. Retrieved May 24 from http://www.women2top.net/download/home/adler_web.pdf

brreg.no (2012). ASA. Retrieved February 27, 2012 from http://w2.brreg.no/enhet/sok/treffliste.jsp;jsessionid=Tps7Ph2GjWWQT5FYfBJYhLTMrWM0DSXzhhyyvZJzVl8jz4rRRBFp!1725350056?navn=ASA&orgform=0&fylke=0&kommune=0&barebedr=false

Heidenreich, V., & Engelstad, F. (2010). *ASA - ingen flukt fra kvinner*. Retrieved April 16, 2012 from www.samfunnsforskning.no: http://www.samfunnsforskning.no/samfunnsforskning.no/ISF/Nyhetsarkiv/ASA-ingen-flukt-fra-kvinner/(language)/nor-NO

Indseth, I. (2010). *Flere kvinner i styrer gir verdifall*. Retrieved March 21, 2012, from E24.no: http://e24.no/jobb/flere-kvinner-i-styrer-gir-verdifall/3537627

Jørgensen, S. S. (2010*). Slik unngås kravet om kvinner*. Retrieved April 16, 2012, from www.aftenposten.no: http://www.aftenposten.no/okonomi/innland/article3853754.ece#.T8uRB9V7p_c

Karkov, R. (2011). *Konkurransevegring forklarer ikke lønnsforskjeller*. Retrieved February 28, 2012 from www.forskning.no: http://www.forskning.no/artikler/2011/januar/277659

Kennon, J. (2012). *The Board of Directors.* Retrieved February 5, 2012 from http://beginnersinvest.about.com/cs/a/aa2203a.htm

lovdata.no. (2012). *Lov om allmennaksjeselskaper (allmennaksjeloven).* Retrieved February 6, 2012 from www.lovdata.no: http://www.lovdata.no/all/hl-19970613-045.html

lovdata.no. (2012). *Lov om likestilling mellom kjønnene (likestillingsloven)*. Retrieved February 6, 2012 from www.lovdata.no: http://www.lovdata.no/all/hl-19780609-045.html

Mellemstrand, C. (2009). *Kjønnsgapet består*: Retrieved February 6, 2012 from www.forskning.no: http://www.forskning.no/artikler/2009/august/227099

NHO. (2012). *Ny Female Future runde*. Retrieved April 12, 2012 from www.nho.no: www.nho.no/female-future/ny-female-future-runde-article24477-63.html

Ordnett.no. (2012). *Public limited company*: Retrieved 5 February, 2012 from www.ordnett.no: http://ordnett.no/search?search=public+limited+companies&lang=en

regjeringen.no. (2011). Barne-, likestillings- og inkluderingsdepartementet: *Likestilling for likelønn: regjeringen.no*. Retrieved February 6, 2012 from www.regjeringen.no: http://www.regjeringen.no/nb/dep/bld/pressesenter/pressemeldinger/2010/likestilling-for-likelonn.html?id=626450

Røys, H. G. (2006). *Kvinner og arbeidsliv*. Retrieved February 12, 2012 from http://www.regjeringen.no/nb/dep/fad/aktuelt/taler_og_artikler/minister/tidligere_fornyings_og_administrasjonsmi/2006/kvinner-og-arbeidsliv.html?id=113752

snl.no (2012). Aksjeselskap. Retrieved June 4, 2012 from http://snl.no/aksjeselskap

ssb.no. (2010). *Kvinneandel i høyere utdanning, etter fagfelt*: ssb.no. Retrieved January 17, 2012 from ssb.no: http://www.ssb.no/ssp/utg/201001/03/tab-2010-03-01-02.html

ssb.no. (2010). *Menn styrer aksjeselskapa*. Retrieved January 17, 2012 from www.ssb.no/emner/10/styre

ssb.no. (2011). *Del kvinnelege styrerepresentantar i AS og ASA*: Retrieved January 8, 2012 from www.ssb.no: http://www.ssb.no/styre/

stortinget.no. (2010). Stortinget og demokratiet: *Kvinner på Stortinget*. Retrieved February 12, 2012 from www.stortinget.no: http://www.stortinget.no/no/Stortinget-og-demokratiet/Historikk/Kvinner-paa-Stortinget/

Voll, B. I., & Trøite, J. K. (2011). *Åpner for kjønnskvotering i vanlige AS*. Retrieved January 18, 2012 from www.nrk.no: http://www.nrk.no/okonomi/apner-for-kvotering-i-vanlige-as-1.7539228.html

White Water Group. (2012). *Quotas the "only way to increase number of women in boardrooms" say influential women's business networks*. Retrieved May 2, 2012 from http://www.whitewaterwomen.eu/wpcontent/uploads/2012/03/QuotasPressReleaseMarch12..pdf

9.5 Annual Reports

All reports are from 2010

ABG SUNDAL COLLIER HOLDING ASA

http://www.abgsc.se/Global/Annual%20Reports/ABGSC%20Annual%20AccountsNY%202010.pdf

ACTA HOLDING ASA
http://actaarsrapport.no/2010/pdf/ACTA_aarsrapport_2010_NO.pdf

AF GRUPPEN ASA
http://www.afgruppen.no/upload/Finans/%C3%85rsrapport%202010%20-%20AF%20Gruppen.pdf

AKER ASA
http://www.akerasa.com/upload/files/aker_nor_2010-print.pdf

AKER SOLUTIONS ASA
http://www.akersolutions.com/Documents/Investors/Annual%20reports/AkerSolutions-2010-red.pdf

AKTIV KAPITAL ASA
http://www.aktivkapital.com/Global/Corporate/Financial%20reports/Annual/2010_AK_report.pdf

AKVA GROUP ASA
http://www.akvagroup.com/doc//akvagroup_ar2010_ENG.pdf

ALGETA ASA
http://hugin.info/134655/R/1499151/434702.pdf

ARENDALS FOSSEKOMPANI ASA
http://www.arendalsfoss.no/index.php?show=13&expand=26,13

ASKER OG BÆRUMS BUDSTIKKE ASA
http://investor.budstikka.no/wp-content/uploads/2011/05/Budstikka_%C3%A5rsrapport_lavoppl.pdf

ATEA ASA
http://www.atea.no/Global/ATEA_AR_2010_ENG_WEB.pdf?epslanguage=en

BIONOR PHARMA ASA
http://www.bionorpharma.com/filestore/Arsrapport2010.pdf

BIRDSTEP TECHNOLOGY ASA
http://www.birdstep.com/media/75535/annualreport2010birdstep.pdf

BLOM ASA
http://blomasa.com/ftp/blom_asa_bis/presentations/blom_asa_annual_and_interim_reports/Blom_Arsrapport_2010.pdf

BN BANK ASA
https://www.bnbank.no/wps/wcm/connect/a91dc20046a905e492cdfac3d08421c9/1113_BNB_arsrapp10+lett.pdf?MOD=AJPERES

BONHEUR ASA
http://bonheur.no/arch/_img/9086696.pdf

BORGESTAD ASA
http://www.borgestad.com/get.php?file=borgestad%2Fdoc%2FArsrapport2010.pdf

BYGGMA ASA
http://www.byggma.no/dm_documents/%C3%85rsrapport_Byggma_ASA_2010_eswMW.pdf

CARNEGIE ASA
http://carnegieam.no/media/168337/aarsrapport2010_web.pdf

CERMAQ ASA
http://www.rapport2010.cermaq.no/media/10756/0n_cermaq_annual_report_2010.pdf

DIAGENIC ASA
http://feed.ne.cision.com/wpyfs/00/00/00/00/00/14/AB/15/wkr0001.pdf

DNB ASA
https://www.dnb.no/portalfront/aarsrapport/2010/interactive-konsernledelsen.php#

DNB BANK ASA
https://www.dnb.no/portalfront/nedlast/no/om-oss/resultater/2010/dnbnor_bank_aarsrapport2010.pdf

DNB LIVSFORSIKRING ASA
https://www.dnb.no/portalfront/nedlast/no/om-oss/resultater/2010/vital-aarsrapport-2010-webx.pdf

DNO INTERNATIONAL ASA
http://hugin.info/36/R/1511063/450031.pdf

DOMSTEIN ASA
http://www.domstein.no/files/documents/domstein_aarsrapport_2010_no_org.pdf

EDB ERGOGROUP ASA
http://hugin.info/194/R/1510828/446010.pdf

EITZEN MARITIME SERVICES ASA
http://hugin.info/137138/R/1510882/446082.pdf

EKORNES ASA
http://ir.ekornes.com/~/media/Files/Investor%20Relations/AArsrapporter/AnnualReport2010.pdf

EKSPORTFINANS ASA
http://www.eksportfinans.no/Omoss/FinansielleFakta/~/media/77BC4EE7DCDD480E9C603E773A5443B5.ashx

FARSTAD SHIPPING ASA
http://www.farstad.com/?menu=19

FONDSFINANS ASA
http://www.fondsfinans.no/en/files/2012/02/AnnualReport2010.pdf

FONDSFINANS KAPITALFORVALTNING ASA
http://www.fondsfinans.no/LinkClick.aspx?fileticket=dG-EA7j8d7g%3D&tabid=2054&language=en-GB

FRED OLSEN ENERGY ASA
http://www.fredolsen-energy.no/arch/_img/9086713.pdf

GANGER ROLF ASA
http://www.ganger-rolf.no/arch/_img/9086700.pdf

GLAMOX ASA
http://glamox.com/upload/2011/11/09/2010-annua-report.pdf

GOODTECH ASA
http://goodtech.no/webext/FileUpLoadDB.nsf/0/C1954A091A9913ACC125791700294F93/$FILE/Goodtech%20ASA%20%C3%A5rsrapport%202010.pdf

GUARD SYSTEMS ASA
http://otc.nfmf.no/public/news/12104.pdf

HAFSLUND ASA
http://2010.hafslund.no/dette_er_hafslund/konsernledelsen/

HEXAGON COMPOSITES ASA
http://www.hexagon.no/default.aspx?menu=619

IDEX ASA
http://www.idex.no/viewfile.aspx?id=761

IMAREX ASA
http://imarex.expromo.no/Imarex-Group-Annual-Report-2010.pdf

ITERA ASA
http://itera.no/Documents/Investor%20Relations/Annual%20reports/2010/AAR_Itera_2010_Norsk_web.pdf

KOLIBRI KAPITAL ASA
http://kolibrikapital.no/storage/rsrapport%20Kolibri%20Kapital%20ASA%202010.pdf

KONGSBERG AUTOMOTIVE HOLDING ASA
http://www.kongsbergautomotive.com/INVESTOR-RELATIONS/Financial-Information/Annual-Reports/

KVERNELAND ASA
http://www.kvernelandgroup.com/Investor-Relations/Financial-Reports/Annual-Reports

LERØY SEAFOOD GROUP ASA
http://www.leroy.no/Documents/Aasrapporter/Ler%C3%B8y-2010-NO%20web.pdf

MARINE HARVEST ASA
http://hugin.info/209/R/1507169/442027.pdf

MOELVEN INDUSTRIER ASA
http://www.moelven.com/Documents/Arsrapport/10/moelven-arsrapport2010.pdf

NORDIC SEMICONDUCTOR ASA
http://www.nordicsemi.com/eng/Investor-Relations/Annual-Reports

NORDLANDSBANKEN ASA
https://www.nordlandsbanken.no/portalfront/nba/nedlast/arsrapporter/NB_aarsmeld_2010.pdf

NORGESGRUPPEN ASA
http://rapport2010.norgesgruppen.no/media/10339/0_ng_aarsrapport_2010.pdf

NORSE ENERGY CORP. ASA
http://feed.ne.cision.com/wpyfs/00/00/00/00/00/14/D8/11/wkr0001.pdf

NORSK HYDRO ASA
http://www.hydro.com/upload/Annual_reporting/annual_2010/downloadcenter/Reports/01_annual_report_2010.pdf

NORSKE SKOGINDUSTRIER ASA
http://www.norskeskog.com/Investors/Investors-English/Reports.aspx

NORWEGIAN AIR SHUTTLE ASA
http://annualreport.norwegian.no/2010/pdf_version/annual_report_2010.pdf

NORWEGIAN CAR CARRIERS ASA
http://www.eidsiva.no/reports/134919/R/1511296/449506.pdf

NOS CLEARING ASA
http://www.nosclearing.com/getfile.php/NOS%20Clearing%20ASA/About%20us/Financial%20Reports/Annual%20report%202010%20NOS%20Clearing%20ASA%20_office%20translation_.pdf

OLAV THON EIENDOMSSELSKAP ASA
http://www.olt.no/Documents/%c3%85rsrapporter/%c3%85rsrapport%20OTE%202010.pdf

OPERA SOFTWARE ASA
http://media.opera.com/media/finance/2010/annual-report.pdf

ORKLA ASA
http://hugin.info/111/R/1512331/447868.pdf

OSLO BØRS VPS HOLDING ASA
http://www.osloborsvps.no/Oslo-Boers-VPS/Om-konsernet/Konsernledelsen

PETROLEUM GEO-SERVICES ASA
http://www.pgs.com/pageFolders/40374/PGS%202010%20Annual%20Report.pdf

PHOTOCURE ASA
http://www.photocure.com/upload/Annual%20Report%202010,%20Photocure%20ASA.pdf

PROTECTOR FORSIKRING ASA
http://www.protectorforsikring.no/photoalbum/view/?size=org&id=372111&type=1

PSI GROUP ASA
http://www.psigroup.no/PageFiles/184/2010%20%C3%A5rsrapport.pdf

Q-FREE ASA
http://www.q-free.com/sitefiles/29/QFR_annual_report_2010.pdf

RIEBER & SØN ASA
http://report.rieberson.com/om-rieberson/konsernledelse/

ROCKSOURCE ASA
http://www.pagegangster.com/p/8TIhS/

SCANA INDUSTRIER ASA
http://www.scana.no/sites/all/files/scana/reports/2010nb_0.pdf

SCHIBSTED ASA
http://www.schibsted.com/no/Annual-Report-2010/Arsberetning/Miljo-21/

SEVAN MARINE ASA
http://www.sevanmarine.com/images/stories/Reports/Annual/2010_aarsrapport.pdf

SINOCEANIC SHIPPING ASA
http://www.sinoceanic.no/sitefiles/16/docs/2011/Annual_report2010.pdf

SKIENS AKTIEMØLLE ASA
http://www.skiensaktiemolle.no/rapporte/2010.pdf

STOREBRAND ASA
http://www.storebrand.no/site/stb.nsf/Get/get770f24104acf51bf71499aea7571127f/$FILE/2010AarArsrapport.pdf

TECO MARITIME ASA
http://www.teco.no/arch/_img/9078350.pdf

TELENOR ASA
http://www.telenor.com/no/resources/images/Telenor_ASA_Aarsrapport_2010_NOR_tcm26-58427.pdf

TGS NOPEC GEOPHYSICAL COMPANY ASA
http://www.tgsnopec.com/uploadedFiles/Investor_Relations_Zone/Form_-_Annual_Report/TGSAnnualReport2010.pdf

TIDE ASA
http://www.tide.no/uploads/documents/Tide%20Holding/2011/Arsrapport_2010.pdf

TOMRA SYSTEMS ASA
http://www.tomra.com/default.asp?V_ITEM_ID=385

TORGHATTEN ASA
http://www.torghatten.no/downloadfile.php?i=96da2f590cd7246bbde0051047b0d6f7

TTS GROUP ASA
http://viewer.zmags.com/publication/856a89fc#/856a89fc/42

ULSTEIN GROUP ASA
http://www.eyemag.se/core/main.php?&SITEID=7c58d&PROJECTNR=4379&

VEIDEKKE ASA
http://no.veidekke.com/rapporter/2010/aarsrapport/selskapet/konsernledelsen/

VERDIBANKEN ASA
http://www.verdibanken.no/upload/2012/01/19/verdibanken-asa-2010.pdf

VIKING FOTBALL ASA
http://www.viking-fk.no/newsread/ReadImage.aspx?DOCID=8645&QUALITY=10

VOSS VEKSEL- OG LANDMANDSBANK ASA
http://www.vekselbanken.no/generelt/om_banken/257 (home page)

YARA INTERNATIONAL ASA
http://www.yara.com/doc/33882_Financial%20Report%202010.pdf

APPENDIX

1. The first data set we received from our supervisor left us with a sample of 30 firms. We started out by calculating the percentage of female board members in each of the ASA's. Furthermore, we divided the firms into two groups depending on their level of female representation; "high" (>25%) and "low" (<25%). The composition of the boards in these firms in 2004 would indicate to what extent the law would affect them. If the board consisted of only males in 2004 (a "low" degree of female board representation), the law would potentially affect the firm to a greater extent than if there already was some degree of gender equality on the board. Dividing these firms into two groups emphasized the fact that our sample was too small, inspiring us to conduct a new and larger sample.

2. After conducting our final sample of the 88 firms we were able to locate information about, we tried to group our sample into five categories based on the requirements of the gender quota reform;

Category 1	Firms with boards consisting of 2 or 3 members
Category 2	Firms with boards consisting of 4 or 5 members
Category 3	Firms with boards consisting of 6, 7 or 8 members
Category 4	Firms with boards consisting of 9 members
Category 5	Firms with boards consisting of more than 9 members

This, however, did not turn out to be a feasible solution. The companies did not distribute themselves evenly between the categories, and some of the categories were too small to give us any representative results. Furthermore, we tried to divide the firms into categories depending on which sector they operate in. This gave us very ambiguous results with typically male-dominated sectors having the highest score of female executives. For example, some firms had top executive management groups that consisted of only one person. If this was a female, which was the case in two typical family businesses, the percentages became unrepresentatively high for these firms, and this was again reflected biased in the mean percentages.

3. List of sector codes for the dummy variable “sectorcode”; I_sec1-11:

Sector name	Given sector code
Forsk./Fins.	1
Handel	2
Skipsfart	3
Industri	4
Bygg/Energi	5
Eiend./Rådg.	6
Transp./Reisel.	7
Olje/Gass	8
IT/Tele	9
Prim.nær.	10
Kultur	11